MINING CONGRESS JOURNAL

Volume 10

SEPTEMBER, 1924

No. 9

ANNUAL CONVENTION EDITION

The Twenty-Seventh Milestone
Official Program of the Convention
Outline for a National Mining Platform
History of Western Mineral Development
Review of National Legislation
National Taxation Issues
Industrial Relations in the Mining Industry
A Review of the Coal Situation
Practical Operating Problems
Southern Mineral Resources
Nationalizing Our Natural Resources
The Month's News

Contributors:

Samuel Rea, Sam A. Lewisohn, Harry N. Taylor, John S. Lutes, H. H. Miller, Eugene Thomas, Charles A. Mithe, Harry L. Gandy, Victor C. Alderson, E. H. Wells, Henry Mace Payne, A. G. Mackenzie, C. W. Towne, Theodore Marvin, Lloyd L. Root, Julian D. Conover, Guy C. Riddell, Bert F. Hews, Geo. H. Cushing, McKinley W. Kriegh.

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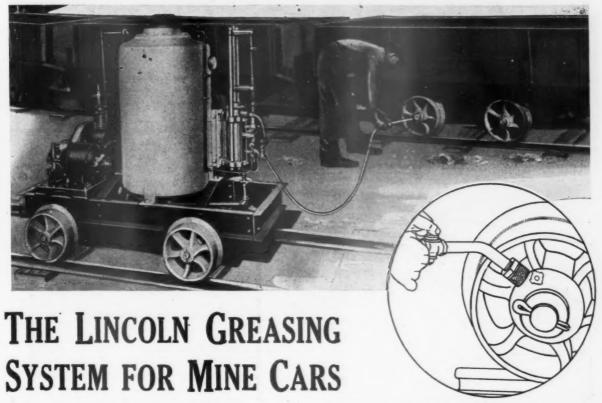
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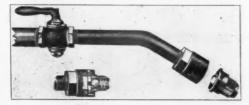


Fig. 2

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SEPTEMBER, 1924

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Published Every Month by the American Mining Congress, Washington, D. C.

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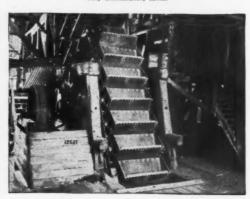
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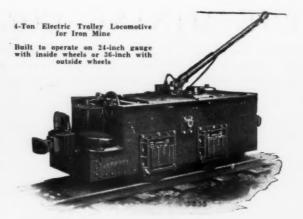
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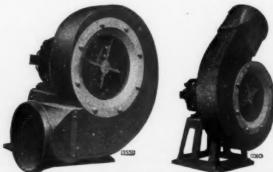
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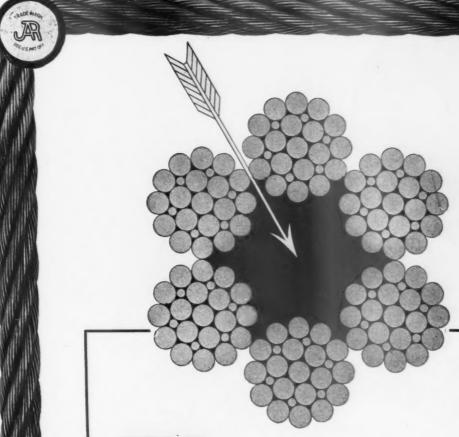
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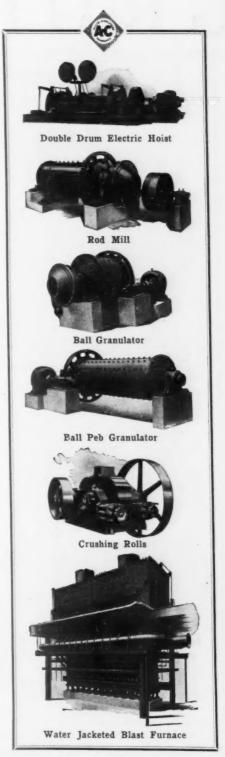
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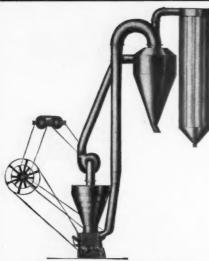
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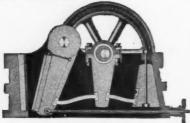
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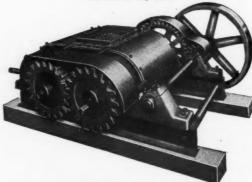
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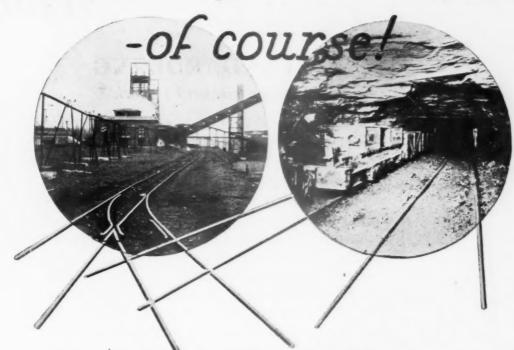
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TAX

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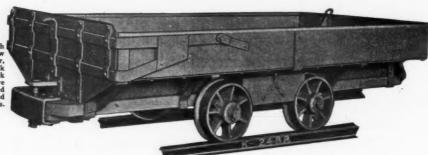
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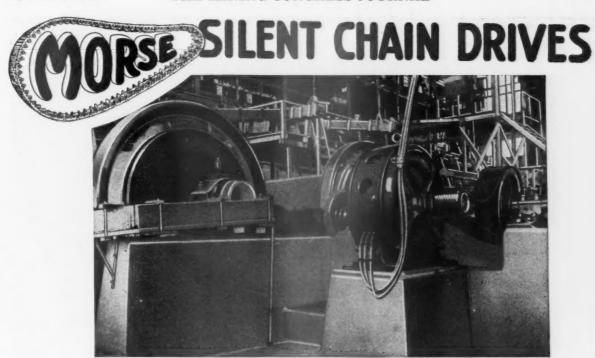
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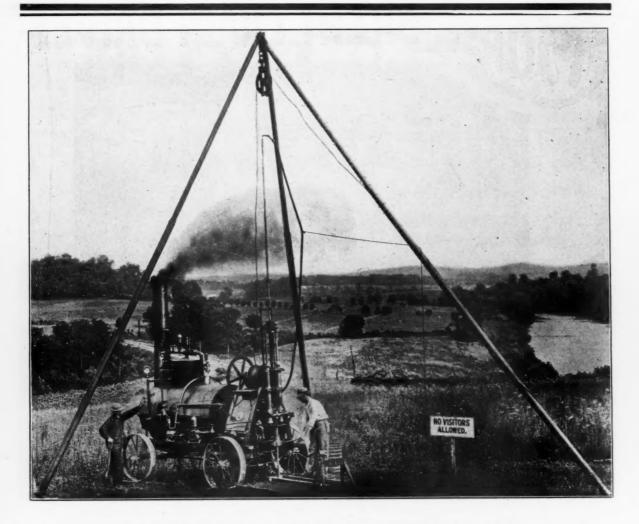
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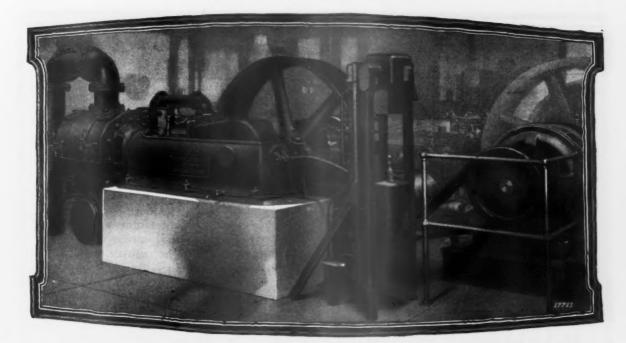
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FOR CANADA REFER-CANADIAN INGERSOLI-RAND CO. LIMITED, 260 ST. JAMES STREET, MONTREAL, QUEBEC.

Ingersoll-Rand

It starts and stops automatically

Mine pumping revolutionized!

Amazing results have been achieved with this new Hazleton Automatic Pumping Unit.

Automatically primed, started, protected and controlled, it is revolutionizing mine pumping throughout the coal regions. Not only does it start and stop automatically, but it is automatically protected in such a way that it stops of itself in times of emergency.

How it operates

Briefly, the operation of the unit is as follows:

When the water rises to a certain height, a float rises, thus effecting the closing of the electric control circuit. The closing of this circuit starts a vacuum priming pump in operation and opens the priming valves. When the priming is completed, the centrifugal pump starts. After the water has been pumped down to its predetermined level, the electrical control equipment properly stops the pump and sets everything in readiness for the next start.

Stops automatically in case of emergency

Unlike ordinary pumping units, the operation cannot continue if there is ever any danger from breaks or leaks in the suction or discharge line or of the pump loosing its water. Protective devices take care of any possible emergency by automatically stopping the pump.

This new Automatic Pumping Unit and Control shoulders all responsibility, eliminating once and for all the necessity of depending upon the human element for starting and stopping operations. Human mistakes, forgetfulness and incompetence with their resultant disasters, are eliminated by the substitution of simple and dependable automatic control.

One man can oversee the operation of a number of units

Pumping in difficult and inaccessible places may be accomplished with no attendance and but few inspections and repairs.

And one mechanic can keep a large number of pumps in perfect operative condition.

Get the facts about this revolutionary pump

The location of our plant—in the heart of a great mining region—enables us to get the equipment you need in the shortest possible time. Our complete line fills every pumping need.

Get in touch with us and we'll give you all the facts about the operation, the development and the proof of the efficient performance of this revolutionary pumping unit. We'll be glad to send you this valuable information by return mail.

BARRETT, HAENTJENS & CO. Hazleton, Pa.



Just Plain Common Sense

If a Nuttall BP Gear will last four times as long as an ordinary gear and not cost over a half more, how can you afford to use any other kind?

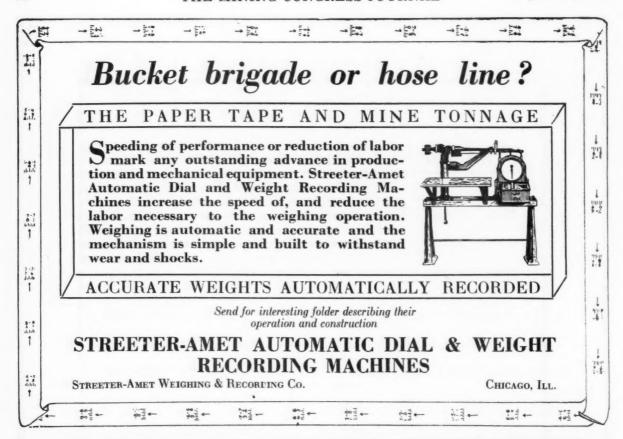
If a Nuttall Helical Gear will run without noise and vibration, and is guaranteed to lengthen the life of your machinery, how can you afford to be without helicals?

You KNOW the answers. Order now!

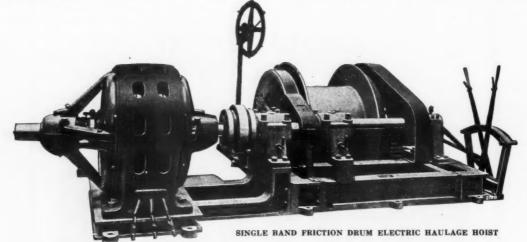
R.D.NUTTALL COMPANY PITTSBURGH PENNSYLVANIA

Philadelphia Office 420 Land Title Bldg. Chicago Office 2133 Conway Bldg.









Hoist sectionalized so it can be easily taken underground. Has normal hoisting duty of 11,000 lbs. at 750 r. p. m., deep drum flanges; motor 300 h. p.

One of a number now in use in different mines. Built in a variety of sizes

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STANDARDIZATION and Production Costs

ACTUAL bookkeeping shows that the principles of standardization as developed by the American Mining Congress and applied to the operations of the Elkhorn Piney Coal Mining Company in one year's time saved them \$45,832.37. This in spite of material increase in output of their mines with consequent increase in equipment required, and of the replacement of old equipment necessary to put standardization in effect.

The Standardization Division of the American Mining Congress has published four bulletins dealing with elimination of waste and costs reduction. It was the principles advocated in these bulletins that the above mentioned company applied.

There are still available for distribution copies of the Third and Fourth National Standardization Bulletins which may be obtained from the national organization. Price \$2.00 per copy.

These bulletins contain recommended practice for both metal and coal properties on underground transportation, power transmission, drainage, ventilation, loading, safety equipment and timbering.

THE AMERICAN MINING CONGRESS

Munsey Building Washington, D. C.

ARE YOU LOOKING FOR

EFFICIENT LABOR SAVING MACHINERY

BETTER INVESTIGATE THE

NOLAN AUTOMATIC CAGING SYSTEMS

Used at shaft bottoms, intermediate landings
At tipples in connection with rotary, crossover and kickback dumps
At the head of inclines

We have something you need.

Write for Circulars



Company Bowerston, Ohio



NOLAN AUTOMATIC CAGER WITH ONE SET OF HORNS



CALIFORNIA CAP COMPANY
MANUFACTURERS OF BLASTING CAPS AND ACCESSORIES FOR HIGH EXPLOSIVES

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-for dependable service

Anaconda Trolley Wire will do its part in eliminating the costly delays of interrupted transportation.

It can be depended upon to give dependable service both under and above ground as it is strong, tough and durable. In conductivity it is unexcelled because it is made from pure electrolytic copper which contains metallic impurities totalling less than 1/100 of 1%.

For dependable and economical service insist upon Anaconda Trolley Wire.

ANACONDA COPPER MINING CO. THE AMERICAN BRASS COMPANY

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EXHIBITOR'S SECTION

9

The
National Exposition
of
Mines and Mine Equipment

at the

Twenty-seventh Annual Convention American Mining Congress

Sacramento, California-September 29th to October 4th

The United States Bureau of Mines

Sacramento and Mine Safety

A Mine Explosion

RESCUE of miners in an explosion will be shown by the Bureau of Mines in a spectacular demonstration at the National Exposition of Mines and Mining Equipment, in Sacramento, September 29th to October 4th, in connection with the convention of the American Mining Congress. The exhibit, which will be the first of the kind shown the public, will give a cross section of the underground workings of a mine, with miners in the stopes and climbing the ladders from one level to another. One section will be sealed as a gas chamber, with spectators able to see what occurs within through glass, including the manner in which mine gases affect miners. The Bureau will take no chances on anything going amiss during the demonstration, as it is to be a safety exhibition, and at the proper time, safety crews will break through with their safety apparatus, administer firstaid to the trapped miners and convey them to the surface for further attention. In the mine there will be displays of different types of mine equipment and adjoining the working demonstration will be displayed all of the newest and latest types of safety equipment. Frank C. Gregory, engineer of the Bureau's Safety Station at Berkeley, is arranging details of the demonstration, which will be given daily. Nothing will be left undone to make the mine and the "disaster" as near real as possible.

> National Exposition of Mines and Mine Equipment & Twenty-seventh Annual Convention & The American Mining Congress & Sacramento, California & September 29 to October 4





A CALIFORNIA HERCOBLAST

On this highway cut, 75 well drill holes, ranging in depth from 35' to 110' were loaded with 4.500 kegs of Herco blasting powder. Seventy-seven thousand cu. yds. of the material broken down required no further handling; another 77,000 cu. yds. were easily excavated.

Herco Powder for Hercoblasting

HERCOBLASTING—themethod of column-loading black powder and firing it with Cordeau-Bickford, which was developed and introduced by the Hercules Powder Co.,—is an established success. It has reduced explosives costs from 20% to 40% at quarries and mines where it has been adopted.

To secure the best results in Hercoblasting it is necessary to use the powder that gives the most concentrated load. *Herco* Powder is composed of grains of various sizes. When poured into the hole, the finer grains fill the spaces between the larger ones. The heavier explosives charge at the bottom of the hole, thus secured, is an important factor in the success of most Hercoblasts.

Herco Powder is also well suited for pocket loading in chambered holes. It costs no more than other blasting powder.

Write our Advertising Department, 934 King Street, Wilmington, Delaware, for a free booklet describing Hercoblasting.

HERCULES POWDER COMPANY

Allentown, Pa. Birmingham, Ala. Buffalo, N. Y. Chattanooga, Tenn. Chicago, Ill. Denver, Colo. Duluth, Minn. Hazleton, Pa. Huntington, W. Va. Joplin, Mo. Los Angeles, Calif.



Louisville, Ky. New York City Norristown, Pa Pittsburg, Kan. Pittsburgh, Pa. Pottsville, Pa. St. Louis, Mo. Salt Lake City, Utah San Francisco, Calif. Wilkes-Barre, Pa. Wilmington, Del.



In '67, Hercules Dynamite First Hit the Gold Trail

metal mining. Hercules explosives have to those who have used them. helped to make possible nearly every mine and construction project which will be vis- by the pioneers of the West in the building ited by those who hit the gold trail to the of our reputation, as well as in the develop-American Mining Congress convention in ment of America's mining industry. Sacramento this September, - just threequarters of a century after the forty-niners blazed the way.

In 1924, the Hercules Powder Company posal of the mining men of today. with 19 plants and 22 sales offices, is a leader

THE FIRST Hercules dynamite was made in the explosives industry. Our success is the result of the unvarying quality of our black powder was used for both coal and products and years of satisfactory service

We shall always remember the part played

We are also mindful of the ever-present obligation to place our knowledge of explosives and experience in their use, at the dis-

That's why you'll see us at Sacramento.

Affentown, Pa. Buffalo N. Y Chattanooga, Tenn. Denver, Colo. Duluth, Minn Hazleton, Pa.

Joplin, Mo. Los Angeles, Calif.



New York City Norristown, Pa. Pittsburgh, Pa. Pottsville, Pa.

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TRAYLOR FOR CRUSHING

JUST A FEW OF THE MANY SATISFIED USERS SCATTERED OVER THE EARTH

New Cornelia Copper Co.
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Mining Co., Ltd.
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Cerro de Pasco Mining Co.
Magma Copper Co.
Kingdon Mining & Smelting
Co.

JAW CRUSHERS

As a primary breaker the Bull-dog Jaw Crusher has no superior.

The pitman is of the Rod Type and stronger than the old style used in other Blake type breakers. Your attention is called to the annealed cast steel water-jacketed cap, to which is firmly bolted a semi-circular dust proof section for retaining the oil around the pitman shaft.

An entirely new toggle system with a careful distribution of extra strength where experience has proven where it was required. The steel-bonded crusher frame is designed to withstand maximum crushing strains.

Bulletin 99-J explains the details of this famous crusher—send for it.

GYRATORY CRUSHERS

THE Bulldog Gyratory Crusher is the result of many years' experience in the designing and manufacture of this class of machinery.

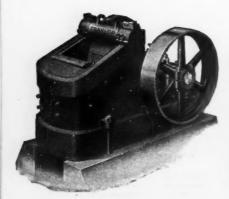
Its bend-proof shaft, Hewes spider, cut steel gears running in oil, self-aligning eccentric journal bearing, positive automatic force feed lubricating system, eccentric of greater diameter and length than others, combined with maximum size receiving openings, assure the purchaser of exceptionally large capacities and minimum operating and maintenance costs.

For a complete description of this crusher see our bulletin 100-J.

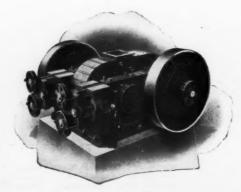
CRUSHING ROLLS

A JO TYPE crushing rolls are specially applicable where medium fine crushing is required.

Every part of the Ajo Crushing rolls is designed with an unusually large factor of safety, amply proportioned to take many times the normal crushing strains. These rolls have double tension rods, self-aligning, solid dust-proof bearings, plate steel pulleys and spring pressures of 15 tons per inch of roll face—features which increase capacity to the maximum and reduces maintenance to the lowest possible point.







EQUIPMENT

We build a complete line of Cement Making, Stone Crushing, Mining and Ore Dressing, Smelting and Briquetting Equipment, also Special Equipment.

TRAYLOR ENGINEERING & MANUFACTURING CO.
Allentown, Pa.

MINE SKIPS

THE Bryant-Wethey patented mine skip illustrated below is so constructed that it is absolutely impossible to dump at any point other than where the dumping device is located.

These skips are built to handle loads up to ten or more tons, and are designed to meet the requirements of the individual shaft. The one illustrated is for use in a vertical shaft.

Let us submit sketches of skips that will meet the shaft specifications of your mine.

SMELTING FURNACES

TRAYLOR smelting furnaces for both copper and lead are built in either round or rectangular form to suit individual requirements, depending upon the character of the ore and the flux and fuel available.

They are fitted with Traylor patented water jackets, which have the tuyere an integral part of the fire sheet, and with the Traylor all metal quick detachable tuyere connection between bustle pipe and tuyere.

Round smelting furnaces are built as small as 36-inch, while we are prepared to furnish rectangular furnaces in any capacity required, based on an extreme width of 56 inches at the tuyeres for copper matting and 48 inches for lead smelting.

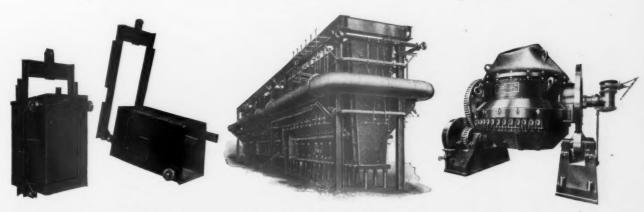
COPPER CONVERTERS

COPPER Converters of both the Horizontal and Great Falls type are used for converting copper matte into blister copper.

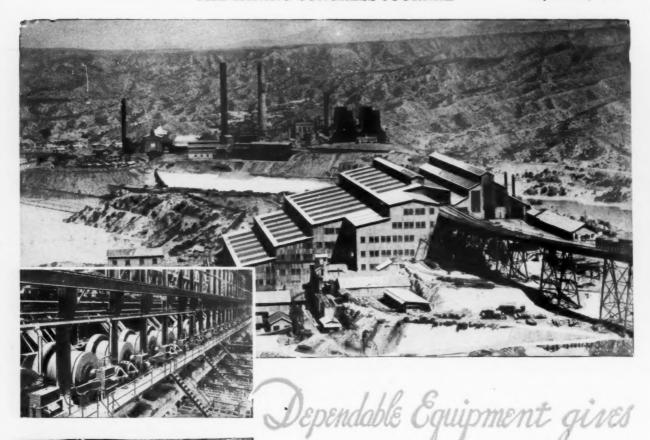
Below is shown one of the Great Falls type converter embodying many exclusive improvements in converter construction, including the Shelby improved tuyere valve and Williams connection, permitting detachment of tuyere boxes without disturbing the tuyere pipes, thus assuring maximum service from the converter lining.

Traylor converters are of exceptionally heavy construction throughout, so as to withstand the hard service to which equipment of this sort is subjected.

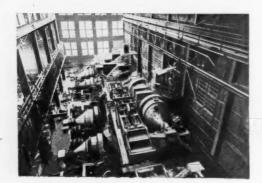
We can furnish you with converters of the proper size to handle your matte.



LET US SEND YOU THIS DETAILED INFORMATION







Ore concentration is a twenty-four hour job. The machinery is operated electrically. But to put the maximum tonnage through the mill requires *dependable* electrical equipment. G-E Motors and Control have qualified for this strenuous and exacting service.

Standard G-E Motors are used in this work. They have the inherent excellence of design built into G-E Motors for over a quarter of a century. This excellence of design is maintained in every one of the parts that go into the building of a G-E Motor.



There is the right G-E Motor and Controller for every job. G-E engineers, trained in the application of this equipment to machines in the metal mining industry, will gladly make recommendations covering your requirements for dependable service.

GENERAL



Day and Night Service

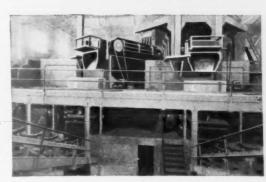
For these reasons G-E Motors stand the severe service demanded in the concentrators of the metal mining industry—doing the work dependably, day after day, and putting the maximum tonnage through the mill every twenty-four hours.

The integrity of complete electrical equipment supplied by the General Electric Company to the metal mining industry, commends it to every mining operator who places dependable operation at the head of his list of requirements of electrical apparatus installed by him in his plant.

General Electric Company Schenectady, N. Y. Sales Offices in all Large Cities



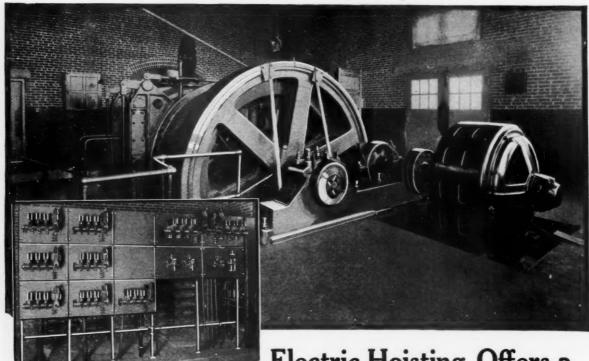




43B-70

ELECTRIC

Electrical Equipment



G-E 350 H.P. Slib-Ring Induction Motor and Automatic Control Equipment operating main shaft hoist at Pennsylvania coal mine.

Electric Hoisting Offers a Sure Way to Cut Shaft and Slope Costs

Long steam lines and other standby losses make the wasteful steam hoist a feeble rival of the modern electric hoist equipped with G-E Motors and Control.

For years G-E engineers have specialized in design and construction of motor and control equipment especially fitted for the severe requirements of coal mine hoisting service.

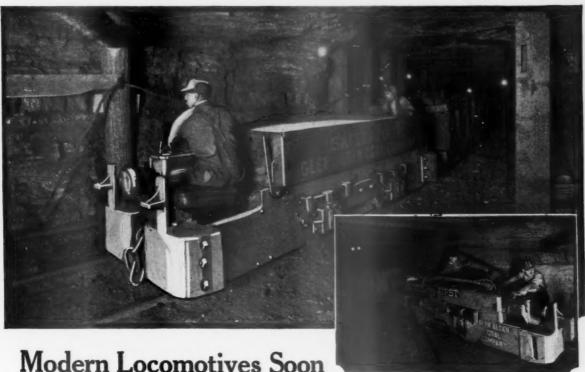
G-E engineers will gladly cooperate with you in converting present steam driven hoisting equipment into more serviceable and economical electric hoists.



General Electric Company Schenectady, N. Y. Sales Offices in All Large Cities

43B-878

for Lower Costs per Ton



Modern Locomotives Soon Pay for Themselves in Lower Costs-per-ton-mile

Transportation is the "neck of the bottle" at most mines today.

Locomotives capable of drawing more cars at higher speeds are needed for carrying out any program for lower costs-per-ton. Larger mine cars and more tonnage per trip are also essential factors in applying mechanical loaders successfully.

G-E Mine Locomotives, both trolley and storage battery types, embrace features of design and construction which make them one of the outstanding achievements of the General Electric Company. The performance of this equipment speaks for itself wherever it is used.

G-E Trolley and Storage Battery Type Mine Locomotives insure dependable transportation at thousands of coal operations. Their Leaf-Spring and Equalizer Bar construction—a distinctive G-E feature—keeps them on the track.



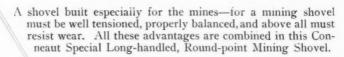
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GENERAL ELECTRIC

CONNEAUT SPECIAL

"XIII"

MINING SHOVEL



The blade of the shovel illustrated is made of the best steel obtainable, can be furnished in any gauge desired, although the regular blade is made from 14 gauge steel. The point can be tempered to a full spring, half spring or stiff point, whichever the user prefers for the work to be done.

The handle is made of tough second growth, Northern Ohio White Ash. These handles are manufactured in our own Handle Plant, and are seasoned in our drying rooms for twelve months before using. The regular 4½-ft. handle is illustrated, but special lengths or drop will be furnished upon request.

This Conneaut Special "XIII" Mining Shovel is only one of the many types of shovels we make.

"THEY WEAR OUT."



A SPECIAL SHOVEL is one which exactly "Fits the Job" for which it is intended—one that will move the most material in a given time with the least possible exertion.

That is the kind which the CONNEAUT SHOVEL CO. manufactures.

Our shovel specialists can supply you with a Conneaut Special Shovel for your work—specially designed, especially forged and heat-treated from special analysis steel, and specially balanced to enable the user to perform more work—"without knowing it."

We ask that you give our shovels a trial under our special "30-Day" Trial Offer—and be one of our many satisfied customers.

"30 DAY TRIAL OFFER"

Try a dozen Conneaut SPECIALS in your shoveling gangs for thirty days. If, after that time, they have not saved at least twice their cost, send us a check for whatever you consider they are worth to you, and we will send you a receipt in full.

MANUFACTURED BY

THE CONNEAUT SHOVEL CO.

CONNEAUT, OHIO

SOLD BY OUR WESTERN AGENTS

A. L. Scott & Sons

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SAN FRANCISCO, CALIF.

GOODMAN METAL MINE LOCOMOTIVES



See this one on view at Sacramento









SPECIFICATIONS

Spring draft gear and spring bumpers.

Reinforced side plates.

Controller - Fingers interchangeable throughout.

Motors - Two; ball-bearing; dust tight; amply lubricated, easily accessible.

Spring motor supports.

Gears-Single reduction, spur gears; hardened teeth.

Axle bearings-Large, fully enclosed against dust and grit; oil waste lubrication.

Motor Axle Bearings-Large; fully and easily lubricated by automatic lubricators.

Frame suspended on double springs, extra long and resilient.

Battery Box Covers - Drip proof; open in 7 inches clearance height.

Battery Box Rollers-Permit easy removal of battery box. Hinged latches retain box in place.

Headlights - Spring supported; located so as to aid in loading cars.

Instruments - All instruments necessary for protection and operation of locomotive on instrument board, directly in front of motorman.









MANUFACTURING CON CHICAGO, ILL. BIRMINGHAM

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VANO BLOWERS FOR AUXILIARY MINE VENTILATION



Electric Motor Driven VANO Blower

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Small, light and portable. Deliver far more air than fans of any other design of the same diameter. The air leaves the blower in the same direction as it enters, namely, parallel to the axis. This makes them readily adaptable for installation in pipe lines. The motor driving the fan cannot be overloaded. The power consumption stays constant no matter whether the length of the ventilating duct is increased or reduced. duced.



See Our Exhibit Space No.



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351 Park Ave., Worcester, Mass.

FOR CONVEYOR AND **HEAVY DUTY TRANSMISSION**

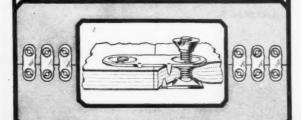
OST of the engineers using FLEXCO H. D. Belt Fasteners have had previous trouble in holding together their tight butt conveyor and heavy duty transmission belts. These fasteners are intended for rugged service, and we have yet to receive from thousands of installations one legitimate complaint that they have not stood up.

Illustration below shows compression principle For belts of 5-16 inch to over 1 inch thickness

Write! Our consulting service is at your disposal Exhibiting Space No. 17, Mr. H. L. Coats in Charge

Flexible Steel Lacing Co.

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N any installation where the belt will stand up, Alligator Steel Belt Lacing gives reliable service—often lasting the full life of the belt. Applied with a hammer as the only tool. Compresses the belt ends in a grip of steel, each tooth a tiny vise that prevents unequal stretching, tearing and internal friction on belt ends.

Used and recommended by leading manufacturers of transmission and conveyor belting. Makes friends easily—and keeps them. At your dealer's.

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Flexible Steel Lacing Co.

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You can obtain maximum efficiency from your du Pont explosives *only* when you use accessories made to detonate these explosives.

In any blasting job you have too much money invested in explosives and work of preparation to run the risk of failure through the use of any but the best accessories.

With du Pont explosives use only the accessories bearing the du Pont Oval—then you'll get the results you're after. Their cost is small compared with the cost of the whole blasting job.

Du Pont has been making explosives and accessories for 122 years. This long experience is your insurance of highest quality.

Blasting Caps
Delay Electric Blasting
Caps
Blasting Machines
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Leading Wire

Fuse
Delay Electric Igniters
Rheostats
Cap Crimpers
Tamping Bags

Electric Blasting Caps

Write for Blasting Accessories Catalog containing descriptions and illustrations of du Pont accessories and practical information about their use.

E. I. DU PONT DE NEMOURS & CO., Inc.

Explosives Department, Wilmington, Delaware

Visit our exhibit in Equipment, American Exposition of Mines and Mine Equipment, American Mining Congress, to be held at Sacramento, Calif., Bept. 29-Oct. 4, 1924

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The NATIONAL EXPOSITION of MINES and MINE EQUIPMENT

27th ANNUAL CONVENTION of the AMERICAN MINING CONGRESS

SACRAMENTO, CALIFORNIA

SEPTEMBER 29—OCTOBER 4



Courage and Opportunity

HE huge mineral development of the United States, greater and more varied than that of any other nation, is due to one thing—courage. The courage of those pioneers in the last three decades who saw not only rich prospects with opportunity for immediate profitable operation but who saw in combination of properties and capital opportunities for vast economies of operation; men whose vision encompassed not the high grade copper of Santa

Rita but the whole Chino project; men who saw below the barren intrusions far richer quartz at deeper levels than had theretofore been discovered on the Mother Lode.

The mining industry has needed all this courage in the years following the war. Abrupt economic changes, legislative restrictions without point or value, abnormally high interest rates, high production costs, have given their perplexing problems. These problems have been most serious in precious metal mining.

In the year 1915 our gold production amounted to one hundred and one million dollars. Our production during the last few years, and at the present time, is approximately half that amount. A large part of the present production comes as a by-product from mines producing copper, lead and other minerals. To the extent that costs of operation have increased since 1915 must we measure the economic pressure now burdening gold production.

The falling off of gold production during the recent years has been erroneously regarded by many as evidence of the exhaustion of western mineral resources.

The fact is that the prospector was driven from the hills by the interference of Forestry officials; that the mining industry was preyed upon by a horde of fraudulent promoters; that bureaucratic laws were passed restricting the raising of funds for legitimate development enterprises; that the relative purchasing value of gold, which had been the stable output of the Rocky Mountain States, so declined as to limit its production that the successful prospectors of the past had already located many more prospects than could be developed or that it was wise to develop.

The Sacramento Convention will arrange a full discussion of all of the handicaps which now affect the mining industry, and an effort will be made to develop conditions under which not only that the western mining industry may be brought back to its old-time stage of prosperity; not only for the benefit of the West, but in order that the nation may not be hampered in its prosperity by the lack of those basic materials which industry requires.



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visitors will meet mining men from all parts of Colorado.

The next day in Colorado Springs they will be offered their choice of inspecting the famous Cripple Creek gold mining district, scenic trips, horseback riding, or spending the time on the golf courses. Headquarters will be the famous Broadmoor Hotel.

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PUBLISHED EACH MONTH BY Subscription Rate, per Year, \$3.00

THE AMERICAN MINING CONGRESS

MUNSEY BLDG., WASHINGTON, D. C. Single Copies, \$0 30

VOLUME 10

SEPTEMBER, 1924

NUMBER 9

THE VALUE OF CONVENTIONS

NCE each year the American Mining Congress brings together mining men from East and West, North and South, for a discussion of, and remedial suggestions for, the solution of their mutually common problems. Only the place of meeting varies—this year in the West, next year in the East, another year in the South. These conventions have demonstrated their value, the results being concerted intelligent recommendations and action in behalf of the industry as a whole. As an example, it was this concerted action that brought about the recognition of mining as a wasting industry through the adoption of the depletion clause in the revenue bill. That concerted action on the part of all branches of the mining industry has become absolutely essential to the welfare of the industry, cannot be questioned.

Mining men will again heed the Convention Call and representatives of all branches will be in attendance at the 27th Annual Convention of the American Mining Congress at Sacramento, September 29th to October 4th. They will demonstrate in the deliberations of the convention the honesty of their aims and their sincerity of purpose. Thus, they will perform a service for the mining industry by inviting and justifying public confidence and support in the solution of their most vital problems.

Those representing the great coal industry in the territory east of the Mississippi River, the iron mining industry of Minnesota, and mineral industries of the South, will find that the problems of the gold, silver, copper, lead, zinc, coal, oil and other mineral industries west of the Mississippi are similar to theirs. They realize that if discriminatory taxation theories can be applied with ease to the coal and iron mining industries, it is only a step further to the inclusion of all other mineral industries. If coal is harnessed under the yoke and with the chains of government regulation, it will be only a matter of time until radical elements will find the means of extending the same treatment to metals and oil.

Private initiative and enterprise have built up the great mineral industries of this country. Much is heard of the profits that have been made, in many cases by men whose fortitude, determination and patience brought them success. About the vast fortunes that have been lost, there is conspicuous silence. Hounds of radicalism wish to deny the fruits of success to those who have succeeded in mining enterprises; but they refuse to offer recompense to those who have failed in their honest efforts to develop values in the mineral industries and who have unsuccessfully sought to add taxable wealth to the nation's mineral resources.

The 27th Annual Convention of the American Mining Congress will challenge radicalism and will bid for public understanding of the problems of the mineral indus-

tries. A national platform for the industry will be formulated, and the planks of that platform will provide the material for bridging the chasm of uncertainty and unrest that now obstructs the passage of the mining industry in its forward movement toward greater development and permanent prosperity.

And such is the value of conventions.

INDIVIDUAL INCENTIVE AND NATIONAL PROGRESS

COMPARISON of the governments of the world furnish incontrovertible evidence that the policies which have controlled the destinies of this country are unquestionably superior to those which have controlled in other nations.

The mineral wealth of Russia is probably superior to that of the United States; Australia has unlimited mineral wealth but the difference in development of these countries furnishes striking proof of the superiority of the American system. If any one principle in business development can be looked upon as the prime influence in industrial development it will be found in the individual incentives which have been furnished here and denied elsewhere.

The pioneer, willing to endure hardships and privations, willing to risk his all in anticipation of extraordinary rewards has been made possible by the American system.

The United States has no monopoly of mineral resources but it has been distinguished and successful because it has offered to the pioneer the adequate reward of his effort. The genius of the Nation has been the development of the individual, leaving to him the fullest opportunity consonant with the opportunities of others.

In times past our Government has attended to its own business—the business of government—leaving the individual complete freedom in the management of his private business. It has not limited the success of the individual; it has said to him "go into the vast arid and forbidden domain of the West, seek out its minerals and they are yours," making only such restrictions as were necessary to protect the rights of other American citizens with similar ambitions.

It has said to its citizens, "go into the field of commerce, and you shall have all the rewards which may come to you through industrious and frugal habits, inventive skill and superior powers of organization." It has stated to the individual, "we ask only of you that you respect the rights of your fellow citizens and yield to the support of the Government through its taxing power your proper share of governmental support."

The vastness of the nation's wealth, the improved living conditions of all of its people, the marvelous labor saving inventions, in fact, the nation itself is positive proof that these principles make for social power, the power which brings the luxuries of aristocracy of one age within reach of the commoners of the following age.

It is not every pioneer who is successful—very many pioneers lack the integrity, the perseverance and the thrift which are essential to success; very many pioneers lack the knowledge and the judgment. These men, because of a misconception of the relation of things, destroy the opportunity.

The success of the int

The success of the intelligent pioneer has made possible the visionary activities of the impractical dreamer—the dreamer who believes that a curb should be put upon the individual earning power; who would destroy that incentive which leads to the greatest effort; who insists that because all men are created equal that all men must enjoy the same things, act alike and think alike without regard to whether the reward inures to himself or to others.

These dreamers did little to make the Nation prosperous but after the Nation was made prosperous believe that a change in this system would make it still better. They believe that the basis of industrial prosperity, the mineral wealth of the Nation, should be taken from control of those whose enterprise has made it available to the Nation's commerce and turned over to a Govern-

ment made socialistic for this purpose.

These theorists completely ignore the lessons of governmental waste, extravagance and inefficiency which have everywhere throughout the world been characteristic of government controlled business. They entirely ignore the Government's prime interest in the development of wealth, namely, the right to tax that wealth for its future support and enable it to continue the beneficent purposes for which it was created; they entirely ignore the importance of big business as the foundation of cheap production which makes the luxuries of life available to all.

If the Government of the United States in its early history had undertaken the same control over its natural resources which is now proposed, this country might now be on a par with Australia and Russia, but it would not

be the United States.

PUBLICITY OF TAX RETURNS

HE proposal that Federal income tax returns and files be made public records, although rejected by Congress at its last session, will be vigorously, and possibly more successfully, urged at the next session. It is a significant fact that those who are clamoring for its passage represent largely a class of people who are not required by law to file returns of income and who pay no income taxes to the Federal treasury because of liberal personal exemptions and deductions. If the advocates of this measure were sincere, they would, in addition to proposing full publicity of income returns, also demand that every individual with an income, without exception and regardless of source or amount of that income, be required to file returns. The whole proposition is manifestly unsound.

There are less than 8,000,000 persons in the United States who are compelled to file returns and pay taxes. There are more than 20,000,000 persons who file no income tax statements and pay no Federal income taxes. There is no sound or just reason for permitting the 20,000,000 to have access to the returns and records of the less than 8,000,000 who bear the brunt of the Federal tax burden. There is no conceivable excuse for such discrimination. No possible benefit can be derived from it. Taxpayers do not want publicity of their private affairs or of the like affairs of fellow-taxpayers. The Treasury Department does not approve the proposal

and dreads the consequences of having a host of "investigators" to deal with if it is enacted. Non-taxpayers have no right to demand its enactment. And Congress should respect the rights of those who pay the government's bills, as well as the wise counsel of the administrative department which serves as collector and custodian of the public revenues.

THE POWER OF GOLD

HE continued importation of gold to the United States is creating much of trepidation on the part of many bankers and economists. It is estimated that our present gold supply is in excess of \$4,500,000,000 as compared with \$1,750,000,000 in 1915. Under the present statesmanlike administration of our Treasury Department and our Federal reserve system, this need only be cause for congratulation.

The most important value of gold is in its use in the stabilization of currency systems and its guarantee of credits. The financial interests of the United States through the ownership of this vast gold treasure are now able to control the credits of the world and have the power to help themselves and the world by the beneficent and wise administration of this agency of

world power.

To feel kindly toward European nations is but the natural impulse of those who always desire to aid those in need of assistance. To possess the ability to render that assistance creates the opportunity for the United States as a nation to direct and assist foreign nations in the stabilizing of their industries, the balancing of their budgets and a return to normal conditions, which are essential to their happiness and prosperity, and at the same time to exercise the equally important function of guaranteeing a continuance of that aid so long as it may be needed.

The United States has thus come into a position in which she may be the beneficent autocrat of the world's happiness and destiny and forever insure for our own people the approval and the kindly approbation of the world at large. The United States, better than any other nation, can be trusted to assume power as the financial dictator of the world's progress. No other nation could assume that position with the approval of the other

countries of the world.

A benevolent despot needs broad vision and wise counsel. The United States will need masterful statesmanship and benevolent impulse both to retain the power and to use it wisely.

CREATION OF WEALTH

HE only way by which a natural resource of mineral character can be made of value is by the process of discovery and development. When this has been done there then, and not until then, exists a taxable value. Without the pioneering patience and initiative that was necessary in the development of the mineral industries of this country, without the private capital that has been hazarded in uncertain and speculative mining ventures, the astounding progress that has been made would have been impossible. Governments have never been successful in discovering and promoting mining enterprises. The Government of the United States has never been permitted by its people to hazard and waste the public funds in prospecting and "wildcatting" for oil wells and mines. Thus, if private initiative and capital had not accepted the risk and performed the task of developing the great mineral industries of the country, they would now be undeveloped, and this nation would not now occupy the place

it does among the nations of the world.

Recently taxation measures have imposed burdens that actually have stifled mineral development. The reason for this is that state and local tax laws generally fail to recognize the fact that every dollar above expenses received from the sale of the products of mines, oil wells and gas wells, represents profit only in part and in part return of capital. In other words, before operating profits can be determined in any mining operation, the fraction of the owner's capital, termed depletion, which is invested in each unit that is removed and sold must be ascertained and deducted from the gross receipts along with expenses. When production begins, depletion begins.

Congress recognized depletion only after it became apparent that high war-time taxes threatened confiscation of the owner's capital to such an extent that prospeeting was being discouraged, mineral development stifled, and mineral production curtailed. To have continued mining operations under the burden of high taxes, without recognition in the tax laws of the principle of depletion, would have been disastrous. Congress therefore enacted a law that provided for a depletion allowance in the case of mines, oil and gas wells,

and timber.

When the high war taxes of 1917 were levied it was found that the discoverers of mines, and oil and gas wells who made their discoveries after March 1, 1913, were not protected or recompensed in the wasting and exhaustion of their properties, as were those whose discoveries were made before March 1, 1913, and those whose properties were acquired by purchase after discovery. And to correct this situation Congress amended the law in 1918 by providing for a depletion allowance to discoverers, who made their discoveries after March 1, 1913, "based upon the fair market value of the property at the date of discovery, or within thirty days thereafter.

Although it was the evident intention of Congress that this provision of the law should apply in all cases where new and valuable mineral deposits were discovered after March 1, 1913, this intention has been defeated. Less than a score of discoveries, during the ten years since 1913, have been allowed metal miners under this law. Only recently, the Secretary of the Treasury was advised of the diversion of more than \$50,000,000 of capital in a single organization from exploration and development work in western mining states to tax-exempt securities. Notwithstanding these facts, the discovery provision was drastically modified in the 1924 revenue act and its repeal even has been suggested. A distinguished Senator, who ought to know better, carelessly referred to it as "a most ingenious scheme to rob the Government." How can taxpayers secure justice when their vital problems are thus

thoughtlessly considered?

Mines are constantly in the process of liquidation. In the case of many minerals-particularly metals-complete liquidation is prevented only by continuing discoveries of new and previously unknown reserves. The country needs a prosperous mining industry. It needs new oil wells more than ever before. A proper interpretation and application of the discovery provision of the income tax law will mean greater profit from mining enterprises upon which to levy taxes. Thus the country will be benefited without any appropriation whatever from the government revenues to stimulate the new mining enterprises that will come into being as rapidly as new discoveries of mineral deposits are made

to take the place of existing deposits that are being rapidly exhausted. These new enterprises furnish employment to labor, local markets for farmers, tonnage for the railroads, taxable wealth for state and local governments, and necessities for our civilization. Favorable consideration of this matter by Congress therefore is in the public interest.

SOUTHERN OPPORTUNITY

HE linking of natural resources with productive enterprise is a man-size job. Certain types of natural resources will be developed regardless of their distance from their natural market. Obviously the governing factor is the relation between cost of production and transportation and sales price. A survey of the available mineral resources of the South has been under way by the American Mining Congress since the first of the year. Interesting and surprising figures and statements are being assembled. Many of these southern resources are of the class which must find a market near home. Clays, gravel and even coal are distinctly limited in their radius, but you can sell clays to manufacturers of brick, tile and earthenware; you can in turn sell these commodities to newly constructed homes and factories. Newly constructed homes and factories demand cement construction and improved roads which can be built through an increase of prosperity among the taxpayers who must pay the cost. Mineral resource development of this type, therefore, is dependent upon the general development of the district. The South has the greatest natural incentive to offer in the development of its power. Manufacturing industries of New England are moving south that they may get their power, raw materials and labor with a minimum haulage. This means more building, more road construction and more use for mined and quarried products of low tonnage value. Every effort toward a survey and classification of such resources, which will give a basis and incentive for this type of progress, is of inestimable value. The work which has been done by the American Mining Congress as an authoritative basis of information for this type of progress and development points the way to the manufacturer who is looking for just such opportunity. More and more is intelligent business investigating the factors of cost and possible future development in choosing the locations for its plants.

CENTRALIZATION OF POWER

ANY years ago the Sherman Anti-Trust Law was enacted by the Congress of the United States for the purpose of preventing the monopolistic control of business. Various decisions in which the validity and meaning of this law have been under question have been handed down by the courts. Yet in spite of court rulings attempting to clarify the subject, there is still question as to the exact meaning of the law. During the same period the importance of big business to the nation has been more and more clearly shown. Even though the makers of the law had in mind the curtailment of big business, the aggregations of capital have gone on simply, and only because it was found that large-scale production means efficiency and that efficiency in production is necessary to cheapen the cost to the consumer. Any law which interferes with the ability of the consumer to secure the necessaries of life is not considered reasonable and the Supreme Court of the United States has interpreted the law only as an inhibition of unreasonable combinations.

This construction of the law required that steps should be taken looking to the regulation of necessary monopolies. The most dangerous of monopolies is that monopoly which, through political management, is put beyond the control of its patrons.

The transportation business of the country is one which requires large aggregations of capital for the several systems which so far as permitted compete with each other. During the war, as a government monopoly, the railroads of the country were operated at a gigantic loss to the public. The deficiencies thus created, of more than fifty millions of dollars, were created at a time when the business of the railroads exceeded their capacity and at a time when the freight and passenger charges were greatly in excess of any other period in With full capacity traffic and high rates the railroads should have made an enormous profit. Notwithstanding these conditions, a very large financial deficit was created, the public was inconvenienced and its business transactions hampered by the failure of the roads, under political management, to perform the required transportation service.

At this time there is a strong movement on foot looking to government ownership and operation of railroads and coal mines. The coal mines of the United States, when not interfered with, have furnished the cheapest coal which has been available to consumers in any country of the world. Our magnificent industrial growth has been based largely upon cheap power, which is another term for cheap coal. Notwithstanding these facts the failure of mines and railroads to function advantageously when under government management is looked upon as sufficient excuse for demanding permanent government control.

It will be well if the public will carefully examine the situation which will be developed by the public ownership and operation of the transportation systems of our country, particularly to discover whether they are willing to assume the increased taxes which will be necessary to meet necessary deficits.

The railroads of the United States now pay in taxes approximately \$535,000,000. If these roads were under government ownership they would be free from taxation and this deficit would necessarily be made up by other taxpayers. The lowest estimate at which these railways could be purchased is approximately \$35,000,000,000. This estimate is based upon the value of railroad stocks and the general estimated market value of the railroads. The Nashville, Chattanooga and St. Louis Railroad has a book value of \$191 per share. The Interstate Commerce Commission's recent valuation of this railroad is on the basis of \$360 per share, almost double the estimate upon which the \$35,000,000,000 valuation is based. The annual interest upon \$35,000,000,000 at 4 percent is \$1,400,000,000. This amount, added to the present return of the roads, amounts to \$1,935,000,000-the direct deficit which the taxpayers of this country, the farmers and the business men, will be called upon to assume.

It will be claimed by advocates of government ownership that these railroads will be made to earn a profit which will offset the deficit above outlined, but our experience in government management justifies the belief that the railroads would not earn a profit but that because of political control the cost of operation would be so large as to leave a deficit in operating expenses. This would be augmented by old-age pensions and various other devices for transferring the money of the taxpayer to the pockets of those who control the railroads. Perhaps an even greater loss would be occasioned by the interference with business of inadequate transportation service.

The farmers and the business men of the United States may well ask themselves where this tendency toward centralization of power in the Federal Government is going to end and who, if not themselves, is to pay the enormously increased tax burden which government ownership and control will necessarily entail.

SILVER AND THE DAWES PLAN

RECENT editorial in the New York Times disapproves concerted effort in behalf of silver producers. That this disapproval is based on lack of information is shown by the further statement that "the Pittman act compelling the purchase of silver at the artificial price of \$1.00 has expired." The most cursory examination of the Pittman act would show that its purpose was to replace in the Treasury Department at the price of \$1.00 per ounce silver already sold at \$1.00 per ounce and was in fact designed to prevent the government from acting as a silver merchant to its own profit and at the expense of the producer.

The beneficial results of the serious cooperative consideration of all phases of the silver problem inaugurated by the American Mining Congress at its Cleveland convention two years ago, are becoming apparent.

Marked strength has been given to the silver market by the evidence of reawakened interest in silver currency in Europe. This was first concretely shown in the recent silver purchase by the Polish Government which was undertaken through negotiations begun by the Mining Congress in pursuance of its silver work.

The Polish purchase has been followed by other negotiations to purchase. With the resumption of sound commerce in Europe expected under the Dawes plan, silver money will play an important part.

That it is advantageous for domestic producers to be in touch with developments of this situation is shown by their accomplishment of the purchase already arranged and under negotiations. There is nothing to be lost and everything to be gained by domestic producers of silver being in as close touch with the development of the market for silver as is possible, especially when they can do so much to develop and stabilize it.

COAL IS ON THE MOVE

HIS old world is going somewhere. It has no adequate idea what it is going to do or how it is going to do it. But, it is changing from one system to another. Nothing is settled. There is hardly a dependable routine in any walk of life. We are in a transition period—from something to something else.

Coal, of course, reflects more acutely that condition than does any other industry because everything comes to a focus in the coal pile. Coal is, to use an overworked word, passing through a heetic experience. It has a fever today and a chill tomorrow. It is either torn asunder by labor struggles or wallowing in the mire of unemployment. It is drawing workers from other industries or it is vomiting men out of its pits into every avenue of life. At the minute, it is in the doldrums. It seems to present a puzzle which is as confusing as is the effort to trace the cause of the world's unrest.

But, if all other problems were apparently as simple as is that of the coal industry, the world would have little to crack its head over. The facts of the bituminous industry are these. The labor in the plants which

formerly produced 60 percent of the tonnage, is unionized. That labor is paid a minimum wage of \$7.50 per day. The non-union mines, which represent the other 40 percent of the productive capacity, pay a minimum wage of \$4.40 per day. The union miner refuses to meet the competition of the non-union miner.

Coal consumption today is about 9,000,000 tons per week. The non-union mines have proved that they can produce 6,000,000 tons per week. At the lower wage, and hence cost, the non-union mine can and will undersell the union mine. This means that, in times of such reduced demand as the present, the union mines which potentially control 60 percent of the capacity will do about 33 1-3 percent of the business.

The union miners resist the introduction of laborsaving machinery. The non-union miners welcome it. And machines exist which can reduce vastly the whole cost of coal production. These machines are drifting to the non-union field.

It takes no prophet to see what is going to happen in coal because it already is happening. The union, by a peculiarly perverse policy, is destroying itself and is ruining the operators who consented to enter a contract with it.

A SIMPLE REMEDY

ANY thousands of years ago it was said that "Money is the root of all evil." It is a reasonable assumption that most of the misunderstanding concerning the mining industry revolves around money—money invested, money paid for labor, money paid for taxes and money accruing as profits to the company.

Admittedly there is a vast amount of misunderstanding and public misinformation concerning the mining industry generally. This misunderstanding has led in many instances to the most unfair discrimination against the industry.

A very simple remedy for much of this misunder-standing is outlined in this issue of the Mining Congress Journal in the article by Mr. H. H. Miller of the Hercules Mining Company wherein there is advocated a standard system of accounting for the mining industry. In summing up the advantages, he points out that standardized methods of accounting would clear misunderstanding on the part of the owner, the investor, the manager, the operating executive, labor, and finally the public. Mr. Miller says, "Were all accounts set up on the balance sheet, those included in income and expense accounts compiled and published in the same basis, using the same terminology, by the various mining companies, the present misunderstanding would give way to a clear understanding of the financial status of all mining companies."

He also points out that many labor difficulties may be directly traced to ignorance on the part of employes as to the actual earnings and financial conditions of the corporation; that employes usually are filled with exaggerated statements of the immense earnings of their company. Also that the favorite pastime of some politicians is their endeavor to ride into public office by promising to shift the tax burden off the backs of other taxpayers onto the backs of rich mining companies. It is contended that a standard form of accounting would show that these ideas are wholly erroneous; that an tax matters, actually the reverse is true; the mining industry carries the major portion of the tax burden of many states, and that "rich" mining companies are largely creatures of the imagination of agitators.

The ideas presented in this article are both feasible

and practicable. Their adoption should go a long way to assist in arriving at a just estimate of the mining industry.

WHAT'S IN A NAME?

LEADER in American industry recently was at some pains to challenge the term "industrial cooperation" and others of the same ilk. We protest. It is not fair to attribute to any movement impractical Utopian unfeasible ideals, because its name suggests dizzy heights. All of us cannot be called John or Henry. If the term "industrial cooperation" is original enough to cause inquiry, it has served a real purpose, for the principles behind that term are so fundamentally sound that they have brought to the movement the sympathetic and earnest interest of leaders in all branches of industry.

Industrial Cooperation is the child of the American Mining Congress, an organization so well rounded in its activities in behalf of the whole mining industry as to discount any motive behind the effort other than the fairest possible basis for the inter-relation of labor and capital.

Any interruption in the orderly production of raw materials, particularly minerals in the ground, vitally affects the industrial life of the nation. Therefore any movement that looks to uninterrupted service by this industry is a step in the right direction. Many are the reasons given for the so-called "industrial unrest," and so long as human beings are different, so long will there remain many reasons for dissatisfaction with things as they are. That very dissatisfaction spells growth.

The principles back of the industrial cooperation movement take full cognizance of the human element and the varied conditions in mining districts. It has no panaeea for the ailment. But it insists there is some good in every plan that is designed to bring about harmony in industrial life. That there are plans in actual operation which have ended strife and contention is a well known fact. But these plans are but little known. One of the purposes of the American Mining Congress work is to find out about these plans, get them before the industry in detail, and let each operator adopt any one or all of the various principles that appear feasible and applicable to his company. Above everything else it is hoped that by setting managers and workers thinking, that each may come to a fairer estimate of the aims, purposes and ambitions of the other.

The idea of industrial cooperation, which holds out to both worker and employer a possible plan for collaboration in seeking solutions for industrial problems and disputes, is winning wide support. The Mining Congress Journal, by continuously and consistently championing industrial cooperation, which means simply the establishment of a basis for complete understanding and sympathetic accord between employers and employes in meeting unsatisfactory and depressing industrial conditions and problems, has endeavored to perform a real service to the mining industry, as well as to the country.

Industrial cooperation is feasible. It is practical. It is sound. It is good business. Employers and workers alike will reap benefits from it. And the general public will not be called upon to suffer from the ravages of sporadic industrial warfare which eats into the heart of industry as well as into the pocket-books and savings of all participants and all innocent bystanders, if the industrial cooperation idea becomes an accomplished fact.

What is in a name? It depends on the principles back of the name.

UNDEVELOPED MINERAL RESOURCES

HE development of America's mineral resources to their present stage represents a splendid achievement; but the opportunity for greater accomplishments in the future development of America's vast potential mineral resources will exist for centuries to come.

Operations in the mineral industries of the United States up to the present time have merely scratched the surface. The American public has little knowledge of the nation's undeveloped mineral reserves.

Generally speaking, the public knows that vast untouched coal, iron and copper deposits exist; but of the conditions that must prevail before these deposits can be utilized, little is known. Of mineral deposits other than coal, iron and copper, practically no authentic information has filtered into the public mind.

Another century will see the utilization of oil shale as a source of fuel for motor transportation, and of its by-products for lubricating and other useful purposes. Oil shale deposits are almost without limit.

Low-grade ore deposits of gold, silver, copper, lead, zinc, tin, manganese, molybdenum, bauxite, barytes, graphite, platinum, quicksilver, and other minerals, have been found in many states; and, although many of these deposits cannot be mined under existing commercial conditions, some day in the not far distant future, improved metallurgical processes, new mining methods, and the initiative and enterprise of the American people, will bring about their utilization.

The policy of the American people should be to encourage development of these potential mineral resources by removing every handicap that tends to prevent their development, and by allowing the developers and producers of minerals to enjoy reasonable and just rewards for their efforts when their operations are profitable.

The necessities of tomorrow will require enormous mineral production to supply the markets of the world. The mineral industries will continue to meet the requirements of domestic manufacture and consumption as well as supply a portion of the foreign demands, if they are allowed to develop and expand and are not stifled to the point of confiscation by taxation and regulation.

These resources are in the ground awaiting development. But if shortsighted policies shall prevent their development, and their utilization at home as well as abroad, foreign producers, with cheap labor and lower transportation costs, will control the output and will supply the world's markets.

The American people should encourage and stimulate the American mineral industries by adequate protection against foreign competition and domestic encroachments of every kind. In this way only can America's vast undeveloped mineral resources be made available for commercial utilization.

LOWER COSTS AND COOPERATIVE EFFORT

HE Manufacturers' Division of the American Mining Congress is rapidly growing in importance as a valuable adjunct to the other divisions of the organization which deal with standardization, taxation, mineral tariffs, mining economics and industrial relations. Just as equitable taxation, adequate tariff protection, standardized mining equipment and practice, and satisfactory labor relations contribute to the prosperity

and welfare of the several branches of the mining industry, so does economical mining through the full utilization of available modern mechanical equipment and the consideration of means for its improvement make possible the enhancement of profits from mining operations. Each year sees a greater necessity for economical mining. Growing competition, lower grade ores and a high standard of living demand that full utilization be made of mechanical equipment and that attention be paid to mining methods and practice.

The collaboration of the mine equipment manufacturers and the mine operators in seeking to improve mechanical equipment and to secure general utilization of the latest improved types of equipment and methods of operation has resulted in distinct benefits to both. The annual national expositions of mining equipment that have been held during the last four years in conjunction with the operators' conventions have brought together manufacturers, operators, managers, superintendents, foremen, electricians and government engineers in frank discussions of practical operating problems and new mining methods and practice.

The American Mining Congress seeks to serve. It believes that the several branches of the mining industry should act as a unit in matters of common importance. It believes that the thought of the entire industry should be concentrated and crystallized through one central organization into concerted efforts in solving legislative, economic and practical operating problems. It believes that it can render no greater service to the mining industry than to become the medium through which the mine official may sit across the table from the man who is trying to solve production problems of the industry and work out these problems with the help of other operators and manufacturers.

The expositions of mining equipment are growing in importance. The exposition at Cincinnati last May demonstrated the widespread interest in this phase of mining conditions. The Manufacturers' Division is rendering notable service in this connection. Its success is assured.

THE INEVITABLE CONCLUSION

THE ocean has its rivers, the rivers their creeks, the creeks their brooks and the brooks their springs. It is the spring that feeds the ocean and the ocean that feeds the spring. If one could dry up the spring, one might, in time, dry up the ocean.

up the spring, one might, in time, dry up the ocean.

A nation has its wealth, wealth its money, money its commerce, commerce its industry and industry its natural resource. It is the natural resource that feeds the nation and the nation that feeds the natural resource.

The analogy is complete. Why pursue it to the inevitable conclusion. It goes without saying that whoever controls the natural resources controls everything that grows out of them. One might as well try to persuade the thinking men that you can have a healthy tree when its roots are encased in concrete as to make them believe that it is possible to have a free and competitive industry when the natural resources are captive.

(Parenthetically, it makes no difference whether the control is exercised by private money or public money. It is enough that it is controlled by some money and that that money is, in turn, controlled by some individual.)

It is now contended by those who label themselves

"Progressives," that it was a mistake ever to have allowed the natural resources to pass out of the hands of Government. They claim, with equal assertiveness, that forthwith control and ownership of natural resources should pass back into the hands of the Government.

That, of course, is equal to the statement that it was wrong ever to have given man economic liberty. Its counterpart is the statement that it was wrong ever to have wrested property from the hands of the state; that it was a mortal sin ever to have ended autocracy with its reign of favorites and to have brought serfdom to an end. This is neither a figure of speech nor a flight of rhetoric. It is the plain blunt truth that whoever controls the natural resource controls all—the industries which rest upon them and the men who work in the factories. To throw the resources then back into the hands of the Government is to go back with a flop to the days of feudalism and autocracy.

What a curious mockery it is for men who espouse such doctrines and who plead such notions to call themselves "progressives" and to stigmatise others as "reactionary." The true progressives of the world fought their ways out of that old slavery. They fought the crown until it gave to men economic liberty. It fought the church until they got religious liberty. They stained Europe red with their blood. Then, they came here and started the same fight for freedom from the same thing on this soil.

After our revolution and the adoption of our Constitution the progressives here fought to keep everything out of the hands of the Federal Government. Patrick Henry almost defeated the adoption of the Constitution on that score. When he was defeated it was not known until the dramatic half hour before the vote was taken whether he would march out of the Virginia convention which was to ratify the Constitution, and start civil war. He stayed in the convention, only on the assurance that the powers of the Federal Government would be restricted by amendments. And it was Patrick Henry who won over Thomas Jefferson and it was Jefferson who won over Madison. They were the progressives of their day. They were fighting to keep power and things out of the clutches of the Federal Government.

In the face of this record—written plain and large on the pages of history—it is a curious mockery to have men who espouse the opposite point of view to proclaim themselves as progressives. They are reactionaries such as have not lived in the United States for a hundred years or in England for three hundred. They want to go back to the days of state ownership and an enslaved working class. And the irony of it is that the workers are fastening—or seeming to fasten—the yokes upon their own necks.

With such an effort in progress, the industries which deal with natural resources have, to an extent, in their keeping the liberties of a whole people. As one old philosopher has said: "By protecting their rights, they defend the common liberties of the people." With so much at stake, it matters little whether the resources are attacked as a whole or whether the attack is centered on one. It makes no difference whether an omnibus measure is proposed or whether the notion is to concentrate on coal or on oil. The fact is that what applies to one must apply to all; that what will apply to all must surely apply to each. That being as true as it is obvious, the natural resource groups cannot dissociate themselves in this struggle. They have at stake of once their own economic independence and the liberties of the whole race.

THE INCOME TAX INVESTIGATION

HE Senate select committee on investigation of the Bureau of Internal Revenue has announced that the investigation in connection with which hearings were held during last March and April, will be continued. Inasmuch as taxpayers are vitally concerned with the charges of graft, crookedness, and inefficiency made against the Bureau, it will afford them a considerable amount of satisfaction to know that these charges, up to date, have not been sustained in any particular. As is pointed out elsewhere in an article in this Journal, taxpayers have had just cause for complaint against rules and regulations that are unduly rigid and procedure that is involved and complicated with "red-tape," but the law itself is believed to be primarily responsible for these unsatisfactory conditions. Therefore, it seems pertinent to quote the opinion of Robert N. Miller, formerly Solicitor of Internal Revenue, and now a member of the General Tax Committee of the American Mining Congress, as expressed in the August, 1924, issue of the National Income Tax Magazine. Mr. Miller says:

"There can be no question that the investigations have made it harder for the Commissioner, operating through large administrative bodies subordinate to him, to give justice to the taxpayer. The investigators have indicated disapproval of some instances in which the Bureau, with entire propriety, has corrected injustice previously done the taxpayer. The investigators encouraged the wholly false belief that any acquiescence by an employe of the Bureau to a contention made by a taxpayer. even if that contention is correct, is probably dishonest. Thus the investigators have placed a premium on arbitrary action by Bureau employes, when the Bureau most needed encouragement in the other direction.

The Treasury Department is still an honest body of men. The exceptions to this, although they exist, are relatively few, in my judgment. Appalling mistakes, big and little, are frequent, but almost all of them result, not from lack of honesty, but from the difficulty of the administrative problem. One of the most difficult tasks of an administrator and one that investigations have made harder is the necessary task of eliminating the tendency to protect the government and the government official, at all costs, instead of trying merely to get the right answer. It has sometimes shown itself in the inclination to correct discovered mistakes only when they are in favor of the taxpayer, but it has many other results as well. The task of overcoming this tendency is made more difficult by the natural feeling of each employe in the Treasury that it is dangerous to him to have his good faith questioned, and that the good faith of a decision will never be questioned when it is against the taxpayer.

"One of the hardest things to eradicate in any organization is the tendency of an officer to give the answer which seems safest for him as an individual, as distinguished from giving an answer which is as nearly right as possible. Fortunately, many of the more important officers of the bureau see quite clearly that in spite of investigations, the right answer is safer, even for the bureau, than the answer which reflects a 100 per cent factor of safety for the government. It is these officials whose influence has prevented the investigations from doing serious harm. In spite of the handicap caused by the investigations, the bureau is functioning better now, on the average, than one year ago."



California's beautiful State Capitol Building, Sacramento, where the sessions of the Twenty-Seventh Annual Convention of the American Mining Congress will be held

THE TWENTY-SEVENTH MILESTONE

Sacramento Convention Will Be Notable—Candid Discussion Of Federal Taxation — Industrial Relations — Stabilization Of The Mining Industry — Government Control Natural Resources—Formulation Of A National Mining Platform—Group Conferences On Tariff — Standardization Mining Methods And Equipment—Coal Problems—Gold and Silver

HE Sacramento Convention of the American Mining Congress will not only be notable as a great reunion of mining men from all parts of the country, but the program will be distinctive because of the frank and candid

discussion of the problems of greatest importance to the

mining industry.

A definite effort will be made at Sacramento to formulate a national mining platform which will have the united support of all branches of the industry and which will lead to practical and definite accomplishments.

Aside from the problems of individual mining groups such as the gold producers, the silver producers and coal operators, the vital problems confronting the industry of greatest interest to all phases of mining are those connected with federal taxation, plans for stabilization of the mining industry, the question of industrial relations, and the necessity of emphatic protest against further encroachment by governmental paternalism in restricting individual initiative in the development of mining enterprises.

These general topics will, therefore, be the bases upon which the convention program at Sacramento is being built, and there will be a timely discussion by representative men of each of these phases. In addition to these general

In addition to these general topics and equally important, will be the discussion of practical oper-

will be the discussion of practical operating problems under the auspices of the Standardization Division of the American Mining Congress. "Lower Costs Per Ton of Output" is a slogan which is of interest to every mining man and the practical demonstrations in Sacramento, together with the splendid displays of equipment machinery in the Exposition of Mines and mining equipment should be a valuable contribution to the success of the Convention.

In order to provide for a presentation of the vital needs of the industry in different districts, the opening session of the Convention on Tuesday, September

30th, will be given over to a presentation by H. W. Seaman, president of the American Mining Congress, of his résumé of the work of the organization during the past year and some outstanding features of the legislative situation in Washing-



H. W. Seaman, President, The American Mining Congress

ton. Following Mr. Seaman's address there will be a series of brief speeches by a representative leader of the mining industry in the various states, presenting the point of view of mining men in regard to the essential requirements of the mining industry in these respective territories. This symposium of the thought of mining men in regard to the needs of the industry will form the basis upon which the Resolutions Committee can work out an effective and valuable mining platform. Among the speakers who will take part in this discussion are Jesse McDonald, President of the Colorado Mine Operators Association, Robert

E. Tally, General Manager of the United Verde Copper Company, Arizona, L. S. Cates, Vice President, The Utah Copper Company, Stanly A. Easton of Idaho, S. Pemberton Hutchinson, President, National Coal Association, and other repre-

sentative leaders of the mining industry from different parts of the United States.

The Tuesday afternoon session of the Convention will be devoted to federal taxation. A. G. Mackenzie, Secretary of the Utah Chapter of the American Mining Congress, is Chairman of this meeting and has worked out an effective program to cover the requirements of the mining industry in regard to federal taxation. This discussion of taxation problems should be of the greatest value to mining men in coordinating the thought of the industry relative to their needs and desires.

On Tuesday evening, at the third general session of the Convention, there will be a very timely discussion of the whole problem of industrial relations. No problem is of greater importance to mining men than the working out of the relationships between the employers and employes. L. S. Cates, of the Utah Copper Company, and Mr. Val Camp, of the United Verde Copper Company, will present the point of view of practical operating managers and will discuss the successful methods which they have employed in

the development of mutual confidence and good will between the employers and employes in mining enterprises. Other prominent representatives, including a representative of the Department of Labor, will be present to share in this valuable discussion.

The fourth general session of the Convention on Wednesday morning, October 1st, will be given up to a discussion of methods for stabilizing the mining industry and also to the requirements of the oil industry. Robert E. Tally, General Manager of the United Verde Copper Company, will present his point of view in regard to methods which can be

utilized in bringing about the stabilization in the mining industry. Representatives of the Chamber of Oil and Mines in Los Angeles, California, will express their point of view in regard to the essential requirements of the oil industry.

Wednesday afternoon will be devoted of a delightful trip to Auburn, California, where the "Days of '49" will be revived and there will be a general jollification which will bring back all of the old color and atmosphere of by-gone days. This is one event which all of the delegates at Sacramento will find to be a real treat and a delightful occasion.

The Thursday morning session, October 2d, will be given up to a Gold Producers' Conference. W. J. Loring, of San Francisco, will preside as chairman. Mr. Loring has worked out with the cooperation of the gold producers throughout the country a carefully formulated program which will be presented by leading gold producers to the Convention for definite recommendation and action.

Thursday afternoon will be devoted to group conferences, including conferences given up to a discussion of the tariff on minerals, to the reports of the Standardization Committee of the American Mining Congress, and to meetings of the Resolutions Committee and other Convention groups.

Thursday evening, October 2d, will be devoted to a presentation of the point of

view of the mining industry in regard to Governmental Control of Natural Resources and to a protest against the further encroachment of governmental bodies in restricting and hampering individual initiative in the further development of mining industries. This is a topic of vital interest to all mining men. To many mining men it seems as if the elimination of governmental restrictions hampering the development of mining enterprises is essential, if the mining industry is to maintain and develop its protection.

Friday morning, October 3d, will be devoted to a discussion of the Problems of the Silver Producers. W. Mont Ferry, President of the American Silver Producers' Association, will preside as chairman of this conference, and there will be an interesting discussion of the needs of the silver producers. Definite recommendations will be made to the Convention and it will be a session of real value to this phase of the mining industry.

Friday afternoon will be devoted to a discussion by various group conferences and to an inspection of the Exposition of Mines and Mine Equipment.

The final event of the Convention



Sidney J. Jennings

program will be the annual banquet to be held on Friday evening, October 3d. This banquet will will be the culmination of the work of the Convention. It will include notable addresses by W. E. Creed,



S. Pemberton Hutchinson

President of the Pacific Gas & Electric Company, on the relationships between the mining and other industries, including the important part which hydroelectric development is playing in the growth of mining; Mr. Paul Shoup, Vice President of the Southern Pacific Company, will speak to the delegates on the question of keeping down taxes as an essential requirement in the further industrial development of the United States. An address will also be made by the newly elected president of the American Mining Congress, indicating his point of view in regard to the industry and its welfare.

ENTERTAINMENT FEATURE

Sacramento is planning to entertain the delegates attending the American Mining Congress Convention with true California hospitality. Throughout the week there will be many informal luncheons and dinners aside from the delightful afternoon and evening in Auburn, California, on Wednesday, October 1st.

The real feature of the entertainment program, however, will be the arrangements for special trips to visit the famous mining districts on Saturday and Sunday, October 4th and 5th. The Sacramento Committee has worked out a series of fifteen optional tours covering not only the famous mining properties in the vicinity of Sacramento, but which will enable the delegates to visit some of

the most historic and beautiful regions in the Sierra Mountains, Full particulars in regard to these side trips will be placed in the hands of the delegates upon their arrival at Sacramento and it will be possible for them to select those trips which will be of the greatest interest to them personally. The Convention will be held at a delightful season of the year and delegates should make it a point to plan to take in these tours on Saturday, October 4th and Sunday, October 5th, as they will be one of the most delightful and interesting parts of the entire Convention.

The mining industry needs cooperative action. It requires the collaborative effort of all of its different parts. The American Mining Congress is the national organization representing the mining industry. All mining men should make every possible effort to be present in Sacramento and aid in formulating a national mining platform which with united support may be made a definite achievement. The interests of the mining industry are at stake. Attendance at the Sacramento Convention will enable you to share in the creation of such a program and enjoy one of the most delight-



Wm. H. Lindsey

ful and distinctive of great reunions of mining men.

THE NATIONAL EXPOSITION OF MINES

The Exposition of Mine Equipment and Machinery at Sacramento will be the very interesting and distinctive feature of the entire Convention. While the number of displays naturally will not be as large as in the national expositions held in large industrial centers in the east during recent years, still the exhibits will be notable because of their character and because of the interesting types of equipment shown.

The exposition will be staged in a specially constructed arena directly opposite from the State Capitol building in the very center of Sacramento's business section, which will enable all of the delegates attending the Convention to have easy access to the display.

PUBLIC EXHIBITS

Among the interesting displays none will be of greater value than the public exhibits which will be made by the United States Bureau of Mines, the United States Department of the Interior, by the California State Mining Bureau, and a number of the important county mining organizations throughout the State. The exhibits will include a splendid demonstration of the Mine Rescue and Safety Work of the United States Bureau of Mines, as well as one of the most comprehensive exhibits of California's metallurgical resources which has ever been made.

The Pacific Coast Office of the United States Bureau of Mines is planning to stage a real demonstration of the effective work which the Bureau is doing in training miners in mine rescue work

and in carrying on a campaign of education for greater safety in mining enterprises. A complete cross section of a mine will be built, with drifts and stokes, in one of the wings of the Exposition arena. This cross section of the mine will enable the spectator to see a spectacular demonstration of a mine explosion and the rescue crew going into the stokes and bringing out their injured comrades. In the mine there will be displays of different types of mine equipment and adjoining the working demonstration will be displayed all of the new and latest types of safety equipment. This demonstration will be in charge of Byron O. Pickard, District Engineer of the United States Bureau of Mines in Berkeley, together with Mr. F. C. Gregory, also of the Berkeley Station. A daily demonstration will be given of the mine rescue work and in addition to the display at the arena the special mine rescue crew, fully equipped with safety apparatus, will be stationed at Sacramento during the week.

CALIFORNIA'S MINERAL RESOURCES

Under the direction of Lloyd L. Root, Director of the California State Mining Bureau, arrangements are being made for a display at Sacramento of one of the largest and most comprehensive exhibits of California's mineral resources which has ever been assembled. Department of Mines and Mining of the Sacramento Chamber of Commerce is cooperating and carrying out plans for this exhibit. Each of the important mining counties throughout the state will have the opportunity of participating. The California display will occupy the center section of the Exposition arena, and the delegates at the Convention will have the opportunity of securing first-hand information in regard to the wealth and



Louis S. Cates



W. J. Loring

variety of the mineral deposits of this State. There will be not only an ample collection of gold specimens, but the display will include exhibits or iron, lignite, copper, structural materials, etc. As far as it is possible every type of California's mineral resources will be shown in this exhibit.

In addition to these very notable public displays arrangements have been made whereby the Colorado School of Mines will participate in the Exposition with an unusually interesting exhibit of the opportunities for development in the oil shale industry. This exhibit will be under the special supervision of Dr. Victor C. Alderson, President of the Colorado School of Mines at Golden, Colorado. Dr. Alderson has made an extensive study of oil shale, and the Colorado exhibit will illustrate the possibilities which are present in the oil shale developments.

It is hoped that there also will be an interesting display of mineral resources from British Columbia and possibly from the Republic of Mexico, as well as some displays from other western mining districts.

Surrounding this public exhibit there will be in the neighborhood of seventy-five representative displays of mine and industrial equipment and machinery, made by important manufacturing concerns from all parts of the United States. This exhibit will include displays of all types of electric equipment, of milling processes and of cost reducing mechanical equipment. The equipment will include exhibits of practically all of the special types of equipment used in western mining and will be of the

greatest interest to mining men. Representative concerns from all parts of the United States are planning to participate in the Exposition and are arranging for distinctive displays. At the present time approximately 40 nationally known concerns have signed contracts for, or reserved space at the Exposition. These exhibits will come from as far east as Worcester, Mass., and will cover the whole range of manufacturing products of this type of equipment throughout the United States.

Below is a brief description of the concerns and their exhibits on the Exposition floor in Sacramento. In addition there will be a large number of concerns which have not at the present time indicated the exact type of equipment which will be displayed.

BETHLEHEM STEEL CO., Bethlehem,

A general display of the latest types of mine track equipment, including mine ties, switches, frogs, turnouts and various other similar devices

THE E. D. BULLARD CO., San Francisco, Calif.

This interesting exhibit will include: Mine safety appliances, safety apparatus and also electric storage batteries and various general safety devices.

CALIFORNIA MACVAN CO., Sacramento, Calif.

This company will exhibit a new process of mercuric cyaniding for the extracting of metal from ores, the exhibit will also include the Vandercook Thickener and other interesting metallurgical equipment.

COAST MANUFACTURING AND SUP-PLY CO., Livermore, Calif.

This exhibit will consist of a general line of caps and fuses used in explosive work in mining enterprises and will be representative of this line of equipment.

COCHISE ROCK DRILL MFG. CO., Los Angeles, Calif.

This display will be made up of various types of pneumatic drills; drills will be shown in operation,

CONNEAUT SHOVEL CO., Conneaut, Ohio.

The display will consist of a complete line of special shovels manufactured for mining and will be illustrative of such equipment.

COPPUS ENGINEERING CORP., Worcester, Mass.

The exhibit will be made up with a complete line of power equipment and particularly will show various types of the Coppus Vane Blower used in mine ventilation. These blowers will be shown in operation.

THE E. I. DU PONT DE NEMOURS CO., Wilmington, Del.

This display will consist of a general line of mine explosives and blasting powders with an incidental display of "Ventube" tubing.

DURO METAL PRODUCTS CO., Chicago, Ill.

This display will be made up of specialties used in mine equipment, including the "Lily Hoist Controller."

ENGINEERING & MINING JOURNAL-PRESS, New York City

Standard McGraw-Hill Trade Publications.

FLEXIBLE STEEL LACING CO., Chicago, Ill.

Display will be illustrative of the flexible steel lacing and its effective use in mine machinery.

GENERAL ELECTRIC CO., Schnectady,

The display will be made up of a complete line of electrical equipment used in mine operation, including Sub-station, automatic control devices, etc.

GOODMAN MFG. CO., Chicago, Ill.

This exhibit will consist of mine locomotives, and general mine equipment.

GOODRICH RUBBER CO., Akron, Ohio.

A representative display of belting, also Linerite, and rubber lining for agitating tables.

GRUENDLER PATENT CRUSHER CO., St. Louis. Mo.

This exhibit will consist of a Greundler Patent Crusher shown in operation.

HERCULES POWDER CO., Wilmington, Del.

The exhibit will include a complete line of flotation oils, as well as a general line of explosives and blasting powders.

HYATT ROLLER BEARING CO., Harrison, N. J.

The exhibit will display Hyatt Bearings for use in conveyors, mine cars and other industrial purposes.

KEYSTONE LUBRICATING CO., Philadelphia, Pa.

This display will consist of Keystone greases and lubricants, especially adapted for mine equipment and mine machinery.

LINK, BELT-MEESE, GOTTFRIED CO., San Francisco, Calif.

The exhibit will include standard line of various types of mine machinery and equipment.

LINCOLN STEEL AND FORGE CO., St. Louis, Mo.

This display will be made up of mine cars, and a special lubricating device for mine equipment and machinery.

MERRILL CO., San Francisco, Calif.

The exhibit will consist of the Merrill Metallurgical processes and Nordstrone Valves.

NAVIGATION INSTRUMENT CO., San Francisco, Calif.

Representative display of special instruments used in mining development

THE OHIO BRASS CO., Mansfield, Ohio,

A representative display of electrical supplies and equipment for mining and hydro-electric properties.

THE OXWELD ACETYLENE CO., New York, N. Y.

A complete exhibit of welding equipment and apparatus. Welding will be shown at the Exposition.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco, Calif.

Exhibit will consist of a complete line of special oils, lubricants, and greases used in mine equipment and machinery.

SKF INDUSTRIES, INC., New York City.

Complete line of precision ball bearings used in industrial equipment, mining conveyors and other similar apparatus.

TRAYLOR ENGINEERING MFG. CO., Allentown, Pa.

Traylor Crushers and other mine equipment and machinery.

TIMKEN ROLLER BEARING CO., Canton, Ohio.

Exhibit will consist of complete line of Timken Tapered Roller Bearings used in industrial equipment in mine cars, and other types of mine machinery.

WESTINGHOUSE ELECTRIC AND MFG. CO., East Pittsburgh, Pa.

The exhibit will consist of a representative display of electric equipment of various types used in mine operations, a considerable portion of the display will be shown in operation.

YUBA MFG. CO., Marysville, Calif.

A model of a Gold Dredge complete in every respect which will be shown in actual operation.

PLACER COUNTY EMPIRE

By P. B. Goss*

Bound for the twenty-seventh annual convention of the American Mining Congress in Sacramento, September 29-October 4, many of the eastern travelers will enter the state and travel its first 100 miles through Placer County. As the traveler descends from the heights of the Sierra's summit the first town of importance is Colfax, a town made memorable not only by its being the center and the distribution point for a large mining center but by its early-day characters, including many of the notables from the literature of Mark Twain. Near here lies the old mining districts of Yankee Jims, Last Chance, Shirttail Canyon and Codfish Canyon.

The county seat of Placer is the city of Auburn, and it is the center of the present mining activities. From this point highways branch out to the famous Grass Valley and Forest Hill sections, both of which have been large producers of gold. In this district there are immense deposits of chrome, manganese, copper, iron, limestone and granite, being developed on a large scale. Good commercial deposits of asbestos and chrome have been worked at times with the most satisfactory results. Among the other minerals which have been developed to some extent are large deposits of clay, suitable for paint and pottery purposes. Although placer mining in this county has already produced over the one hundred million dollar mark, mining engineers state that in the ancient river channels there are still about 200 miles of unworked auriferous gravel channels.

Around Lincoln, a little north of Auburn, lies the rich clay beds which furnish raw material to all the pottery plants of the West and sustains one of the largest manufacturing plants for making terra-cotta tile and other materials for construction purposes. Many of the mineral resources of this county have not at this time been developed commercially on a large scale. There is also promising indications of oil, coal and natural gas. There are possibilities of copper, silver and lead deposits that have so far remained untouched.

During the sessions of the Congress in Sacramento, plans are now under way to present through pageants and pictures of the old mining days, the evolution of mining industries brought down to the present day. Some of the old buildings still standing in the city of Auburn and in the Auburn Ravine, which adjoins the city, will be utilized for that purpose, and the people of Placer County are preparing to extend the old-time hospitality to those who visit this section during the sessions of the Congress.

Tentative Program

The Twenty-Seventh Annual Convention

The American Mining Congress

Sacramento, California, September 29th-October 4th

Luncheon for delegates arriving on special train—with informal speeches.
Preliminary conferences—Taxation and Standardization Divisions.
Famous Pioneer Whiskerino Parade.
State Capitol Park—Reception to delegates.

MONDAY, SEPTEMBER 29th
12:00 M. Luncheon:
2:30 P. M. Preliminar;
3:30 P. M. Famous Pi
7:30 P. M. State Capit

Address of welcome—Hon. Friend W. Richardson, Governor of California.
Addresses of welcome—Representatives of the State of California, City of Sacramento and Sacramento Chamber of Commerce.
Response to addresses of welcome—H. W. Seaman, President, American Mining Congress.
Historical Pageant—Early days in California.

TUESDAY, SEPTEMBER 30th 10:00 A. M. State Capit

MBER 30th
State Capitol.
Topic—Needs of the Mining Industry.
Annual address—H. W. Seaman, President, American Mining Congress.
Addresses—Review of Mining Conditions (5-minute speeches):
R. E. Tally, Arizona.
J. McDonald, Colorado.
W. J. Loring, California.
Stanly Easton, Idaho.
L. S. Cates, Utah.
S. Pemberton Hutchinson, Pennsylvania.
Falcon Joslin, Washington.

2:00 P. M. FEDERAL TAXATION

FEDERAL TAXATON
Addresses:
"Review of Changes in Federal Revenue Laws and Income Tax Procedure"—McKinley W. Kriegh, Washington, D. C.
"Taxability of Distributions by Mining Companies"—Robert Buchanan, San Francisco, Calif.
"Comparison of Practical Effects of Income Tax Rates on Incomes from Dividends, Trusts, or Personal Service"—H. B. Fernald, New York City.
"The Audit and Settlement of Tax Liability"—Robert N. Miller, Washington, D. C.

8:00 P. M. INDUSTRIAL COOPERATION.
Address—J. J. Davis, Secretary of Labor (tentative).
Address—L. S. Cates, Utah Copper Company.
Address—W. V. DeCamp, United Verde Copper Company.

WEDNESDAY, OCTOBER 1st

10:00 A. M. THE NEEDS OF THE OIL INDUSTRY.

Address—"Who Profits from Oil Production?"—A. C. McLaughlin, president, Los Angeles Chamber of Mines and Oil.

Address—"Stabilization of Metal Mining Through Trade Association"—
R. E. Tally, United Verde Company.

Address—The Structural Material and Quarrying Industry.

1:00 P. M. Automobile Trip to Auburn.

THURSDAY, OCTOBER 2d

10:00 A. M. PROBLEMS OF THE GOLD PRODUCERS.

Address—W. J. Loring, Plymouth Consolidated Gold Mining Co.

Address—George Starr, Empire Mining Co.

Address—A. E. Carlton, Denver, Colo. (tentative).

Address—Bruce Yates, Mono Lake Mining Co.

12:30 P. M. Luncheon for the secretaries, Metal Mining Association and Chapters,

American Mining Congress.

2:00 P. M. Group Conferences.

Tariff, Standardization, Taxation, Oil Shale, etc.

TARIFF

resses: "Foreign Competition with American Industries"—A, Cressy Morrison.
"Prospects of Tariff Revision in the Coming Congress"—Congressman
John Raker.
Arthur M. Free, Congressman from California (tentative).

STANDARDIZATION

Addresses:

"Eliminating Waste in Industry"—C. B. Lakenan.

"Applying Mining Standards"—Stanly A. Easton.

"Lower Costs and Standardization"—Chas. A. Mitke.

Papers on Mine Accounting, Valuations, Board of Tax Appeals, Income Tax Regulations, Revision of Revenue Laws: by Paul Armitage, New York; J. C. Dick, Salt Lake City, Utah; T. O. McGrath, Bisbee, Aria.; George E. Holmes, New York.

State Taxation.—The subjects to be discussed at the session on state mine taxation will not be announced in advance of the meeting, since this session is open only to bona fide mining men in attendance at the convention. The speakers at this session will include former Governor E. D. Boyle, Nevada; D. M. Kelly, Butte, Mont.; Judge E. C. Stimson, Denver, Colo.; and A. P. Ramstedt, Wallace, Idaho—all eminently equipped to deal with the details of mine taxation in the several states.

Reports from state members of the General Tax Committee also will be presented.

GOVERNAMENT CONTROL NATURAL RESOURCES.

Address—"Opposition Governmental Paternalism"—F. T. Griffith.

Address—Norman R. Moray, vice-president and general manager, Hartford Accident and Indemnity Co.

8:00 P. M.

FRIDAY, OCTOBER 3d

10:00 A. M. SILVE PRODUCERS' CONFERENCE.
Address—W. Mont Ferry, Salt Lake City, Utah.
Address—J. G. Kirchen, Tonopah, Nev.
Address—Alfred Harrell, California.

Address—Afred Harrell, Cantornia.

Group Conferences.

Discussion of War Minerals.
Discussion of Public Education and Service.
Discussion of Oil Shale Problems.
Inspection of Displays, National Exposition of Mines and Mining Equip-2:00 P. M.

ment.

ANNUAL BANQUET, HOTEL SENATOR.
Address—"Coal and Iron Developments on the Pacific Coast"—Wiggington Creed, president, P. G. & E. Co. and Columbia Steel Corporation.
Address—Paul Shoup, vice-president, U. S. Chamber of Commerce.

SATURDAY AND SUNDAY, OCTOBER 4th and 5th
Special week-end trips to mining camps and California resorts.

^{*} Secretary-Manager, Placer County Chamber of

"DAYS OF OLD-DAYS OF GOLD"

Sacramento Will Recreate Days Of '49 For Visitors To 27th Annual Convention—"Whiskerinos" To Give Unique Entertainment—Valuable Data To Be Presented—Mineral Wonderland Of Western World—Opportunities For Industrial Development Outlined

ALIFORNIA, land of eternal romance and adventurous spirit, her feet on the threshold of an era of industrial expansion and mineral development unequaled before for a like area in the history of the world, has put her house in order for the coming of the delegates to the Twenty-Seventh Annual Convention of the American Mining Con-

gress, held the week of September 29 in her capital city, Sacramento.

It was from Sacramento, the center of California's great gold belt, that the hardy pioneers, after braving the perils of the wilderness west of "St. Jo," Missouri, set forth afoot with pack trains of burros or rode in the swaying, rumbling Concord stagecoaches for the "diggings" after that eventful day in January, 1848, when James W. Marshall's discovery of gold at Coloma on the American River

changed the course of human events. And today, 76 years later, mining men are once more setting forth from Sacramento to find new mineral deposits in the "tin burros" of today. Not the old-time prospector, however. Restrictive legislation and mounting costs of mining have made him almost extinct. Rather, the seekers of mines are engineers and mine operators from other states and lands.

Sacramento, through the Department of Mines and Mining of her Chamber of Commerce, is seeking to give every encouragement to a revival of California's fundamental industry—mining. And the thought uppermost in mind in bidding for the 1924 convention was to give to the mining men of the nation an opportunity to inspect California's vast mineral storehouses, which today produce 53 commercial minerals, aggregating in value for 1923 approximately \$270,472,000. Many varieties of gems and stones

are also produced. And every one of her 58 counties contributed to that total production.

By BERT F. HEWS *

COUNTIES GATHER DATA

So, with a unanimity of action seldom witnessed, her strictly mining counties

Whiskerinos Reproducing the Days of '49

are not only cooperating heartily with the plans of the Sacramento department for the entertainment of the delegates but are also collecting accurate data on their mineral resources for the delegates, organizing mining departments and committees to greet touring delegates, and encouraging a greater mineral development. In other words, they are putting their houses in order. In addition, they are assembling a collection of minerals unequaled before in this or any other state.

It is putting it mildly to say that the delegates will be "swept off their feet" when they gaze at the gold, platinum and precious gems to be displayed in four safes in the rotunda of the State Capitol, where the convention is to be held. One county alone, Siskiyou, already has a \$50,000 collection of gold, and is planning to add materially to it for the convention. The most beautiful ribbon, crystallized and placer gold in the world, embracing every known shade of gold, will be displayed.

Aside from these four safes of gold,

there will be a monster mineral display in the center of the cross sections of the National Exposition of Mines and Mine Equipment, to be held in a great arena facing the west entrance to the Capitol. Here will be the other metals, the industrial and structural minerals, and the salines. And the profusion of these minerals will astound all who have, not

before visited and inspected the mineral districts of California.

Leaves of Time's great ledger will flutter back some seventy-odd years to those halcyon "days of old, days of 249," for the confertainment of the delegates to the convention.

In carrying out these '49 features, the department will have the whole-hearted cooperation of the famous Whiskerinos, who made the "days of '49" celebration in May, 1922, one that the world will never

forget so long as the printed page and the motion picture exist. initial day of the convention is appropriately designated as "Whiskerino Day." Through the cooperation of the Whiskerinos and the city officials, it is hoped to get the entire populace of Sacramento-now estimated at 100,000to don the garb of the forty-niners for this opening day, if not for the entire week. And the Whiskerinos have solemnly sworn to again grow beards as they did in May, 1922, and to don the red shirt, broad-brimmed slouch hat, red kerchief, rough trousers, boots and trusty shooting iron.

It is the plan of the Whiskerinos to meet the special train which is scheduled to leave Chicago on September 23 in true frontier manner on its arrival. It will be properly "shot up" by bearded villains on horseback and raided by grim-faced, red-shirted miners. The "tenderfeet" will be escorted to a long line of old Concord stagecoaches, prairie schooners and burros, resurrected from the pioneer bypaths of California, and

Manager, Department of Mines and Mining, Sacramento Chamber of Commerce, and Editor "Mining Topics."

then taken to a '49 feed after a parade through town. No motor vehicles will be permitted during that time on the streets.

MAY REPRODUCE PIONEER PARADE

If it can be possibly done, it is the plan of the department and the Whiskerinos to reproduce, at noon Monday, the famous pioneer parade, three miles long, which was the big culminating feature of "Days of '49." All the historic counties of California will be asked to enter pioneer floats and delegations in the parade and thousands of school children in quaint pioneer garb will march. All the old rigs and vehicles will be utilized. No motordriven vehicles will be permitted, and there will be ox teams and reproductions of famous saloons and

The Whiskerinos will also play a vital part, assisted by the '49 Log Cabin Club, the Gold Seekers and the Whiskerettes, the three pioneer women's organizations, and by the Redmen, Scouts and Spanish societies in the night program, mingling with the reception crowds and staging some pioneer "stunts."

stores on floats.

Justice E. C. Hart, of the Appellate Court, is the chief Whiskerino and is enthusiastic over the plans for the entertainment of the delegates. "Hangouts," the branches of the grand lodge of Whiskerinos, Camp '49, are being organized in the pioneer mining districts to properly receive the delegates on the various tours following the convention.

PLACER'S HISTORIC PAGEANT

The afternoon of Wednesday, October 1, has been set aside for auto tours for the delegates. For that day Placer County, through its Chamber of Commerce and its board of supervisors, is planning a pageant and night entertainment that will live in the memory of the delegates till the day of their death.

As outlined by Secretary P. B. Goss, of the Placer County Chamber, old Auburn ravine, which produced its millions in the early days, is to be restored for half a mile as it was in 1849. Old "long toms," rockers, crude stamp mills and little log shelters will be again placed in the stream and gravels of the ravine. Old pioneer white miners will return to their days of youth and operate once

again the long sluice boxes, the rockers and the old stamp mills, while the Chinese miners will pan the stream for the gold. Nothing modern will be permitted to mar the truthfulness of this portrayal of early mining days.

Then the old pioneer part of the city

In the Beautiful Grass Valley

of Auburn, at the west end of the community, now desolate and deserted, will be brought to life once more. The long iron shutters will be opened up, and the shelves of the stores will bear pioneer stocks. From the dance halls will come the quaint tunes of the past, the raucous voice of the "caller," the squeak of old violins, and the laugh and jest of the dance hall girls; from the long silent gambling halls will come the click of the roulette wheels, rattle of chips, the shuffling of cards, the voices of excited players and now and then a shot. Of course, all attendants and hundreds of Placerites thronging the buildings will be in true '49 garb.

It is also planned to have El Dorado and Nevada counties take over some of the old buildings and place in them some of their own placer relics.

The delegates will be taken direct to Auburn, arriving at 3 p. m. At 5 p. m. a '49 barbecue will be served. In the evening the old Auburn resorts will operate full blast, with an occasional "necktie party" and shooting affray to add the rough pioneer atmosphere, and no imagination will be required to make the delegates think they are actually back in 1849. About 9.30 p. m. the return trip will be made to Sacramento.

Thus will end a memorable day in the lives of the mining delegates. During the two-day tour of the delegates on Saturday and Sunday, they will be met in

the old mining towns by Whiskerinos, and the outdoor luncheons will have the pioneer atmosphere.

These affairs are only tentatively planned at present, and undoubtedly their magnitude will be increased, as well as others devised for the entertainment of the delegates. It is probable that about two hundred of them will also be taken to Oroville, where gold dredgings originated, Wednesday afternoon, and possibly brought over to Auburn in time for the night's entertainment.

It is certain that no delegate who attends the convention will leave without a faithful idea of how the pioneers of California lived, and without an undying admiration for those sturdy sons and daughters of Yankees who blazed the trail to the western shores of America, who laid the foundation for one of the world's greatest commonwealths-California.

IMMENSE VIRGIN AREAS

It is hardly believable, yet absolutely true, that there are mineralized belts in California as large as some of the New England states which have never been thoroughly examined and have only been prospected for gold in the early days. There are mountains of minerals, the value and nature of which are unknown. There are sections in Siskiyou, Trinity, Modoc, Alpine, Mono and Inyo counties which have never been examined by trained mining engineers or geologists, owing to their inaccessibility. Yet these sections are known to be highly mineralized.

Let us consider, for a moment, some of the other natural resources which must enter into an industrial expansion, although products of the subsoils are the basic raw materials of industry. Today California has the last great pine forests of the United States, as well as immense redwood groves. Her timber supply, if proper conservation methods are pursued, could supply the timber needs of a population of 25,000,000-for which number she has ample room-and the attendant industries. Last year her hydro-electric energy production totaled 4,199,000,000 kilowatt hours, while steam units brought the grand total to five billion kilowatt hours, a per capita consumption of 1,350. Yet the potential hydro-electric development of California is 36,000,000,000 kilowatt hours per year! Her Great Valley, 400 miles long, is the agricultural wonderland of the world, yet there are thousands of square miles of agricultural land uncultivated today. She has unexcelled transportation-by river, by ocean (with some of the world's finest harbors), by rail and by highway. She has a climate which permits operation of industrial plants and of most of her mines 365 days in the year. She has attracted a class of citizenry ideal for industrial work.

Is there anything lacking to make California one of the great industrial commonwealths of the world?

Yes, one vital drawback—she has not yet begun the adequate development of the basic raw materials for industry, minerals. Until these raw materials—primarily iron, coal, lead, zinc, manganese, tungsten, and structural materials—are developed on a big scale, California cannot hope for the industrial expansion to which her natural resources entitle her.

GREATEST MINING NEEDS

Fortunately, though, there has begun an earnest effort to develop these latent basic raw materials. Two new steel plants have recently commenced operations, turning out steel products equaling those of the eastern and midwestern steel centers. It is true that Utah coal and pig iron are used with California scrap at present, but Wiggington E. Creed, the president of the Columbia Steel Corporation operating the plants and the man of vision in the infant steel industry of the state, predicts that before many years California coal and California pig iron will be used.

But California must have capital to further develop her mineral resources; she must attract the attention of the industrial leaders and make them realize the opportunities awaiting them in this truly "golden land." When eastern capital begins to pour into California to develop her industrial minerals, then will she really enter her industrial era. And no one with vision, with acumen to read the signs of the times, to interpret rightly the increasing interest of eastern

Downieville, Sierra County, center of the oldest and newest gold fields in California, Below—Sierra Buttes Mine, Mill No. 9, Sierra City, a property credited with a gold production of \$18,000,000

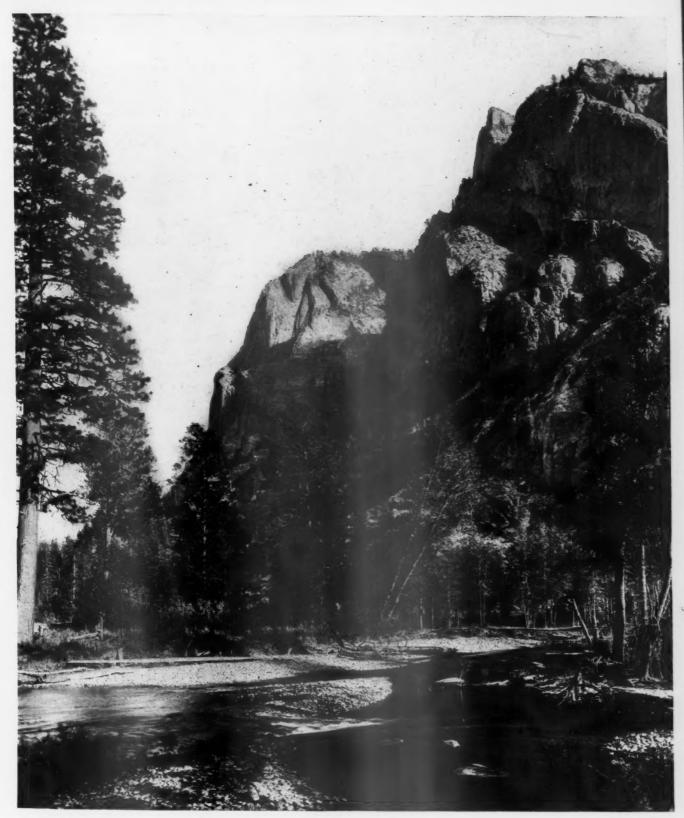
industries in her potentialities, dares to deny that the dawn of that era is with us.

Uncle Sam must look to Far East, to the Orient and to the west coast of South America for his future markets for his industrial products. Furthermore, the day has come when the railroads of the country find themselves sorely taxed to carry across the continent the products of industry, to be reshipped across the Pacific. California is logically the next industrial center of America. But she must have money with which to develop her mineral resources and she must give all the encouragement and help within her power to that development.

With her mineral resources adequately developed and feeding great industrial plants, California could be cut off from the rest of the world and not suffer the lack of a single item that goes to make modern life comfortable and happy. She has everything within her borders.

Therefore, it is with these urgent needs of California's mineral industry in mind, that the Sacramento department of mines and mining is planning one, two and three day tours for the delegates to the American Mining Congress convention this fall after the close of the sessions. These tours will reveal to the delegates the great natural resources of California for the creation of an industrial empire, will open their eyes to a state of opportunities they little dreamed of, and will promote a better understanding of California's problems and needs.

All California extends to the mining, industrial and financial leaders of the nation and of the world an urgent and from-the-heart invitation to come to Sacramento September 29th, to participate in the most important convention ever held in the west, to partake of her hospitality and to view for themselves her latent industrial opportunities.



Hillers, U. S. Geological Survey

King's River, Presno County, California

"There's a whisper on the night-wind, There's a star agleam to guide, And the west is calling— Let us go."



Above, Merced River below Vernal Falls Dr. C. O. Schneider

Lower Views in Glacier National Park Kiser Photo Co.

Courtesy Nat'l Park Service, Dept. Interior



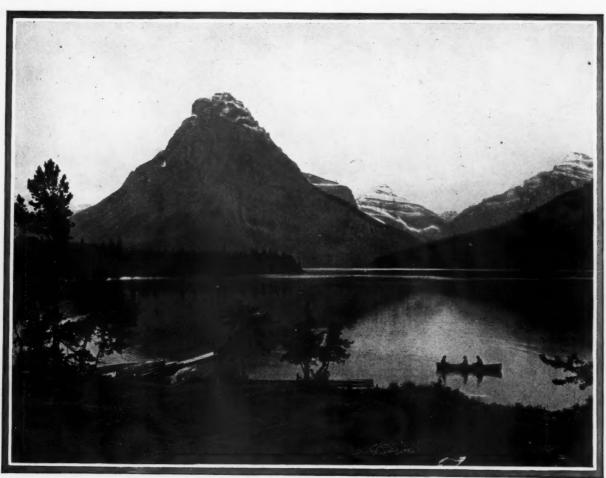
"Big mountains heaved to heaven, Which the blinding sunsets blazon, Black canyons where the rapids rip and roar."



Courtesy U. S. Forest Service

Sawtooth Mountains, Sawtooth National Forest, Idaho

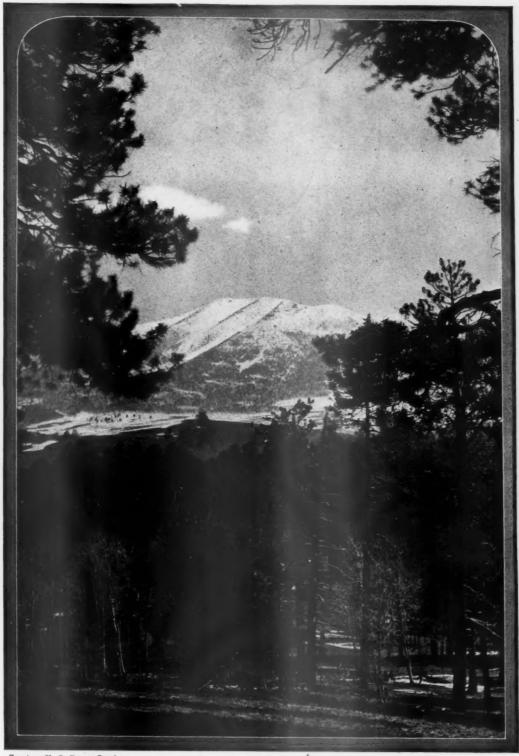
"The lonely sunsets flame and die;
The giant valleys gulp the night;
The monster mountains scrape the sky,
Where eager stars are diamond bright."



Two Medicine Lake, Glacier National Park

Courtesy National Park Service, Interior Department

"Sun, moon and stars give answer;
Shall we not staunchly stand
Sentinels of the stillness,
Lords of the last lone land!"



Courtesy U. S. Forest Service
San Francisco Peaks from Coconino National Forests, Arizona

"The snows that are older than history,
The woods where the weird shadows slant."



Mt. Shasta from a Siskiyou County Lake, California

"Steeped in eternal beauty— Crystalline waters and woods."



Darton, U. S. Geological Survey

Washakie Needles, Hot Springs County, Wyoming

"There's a great, big, broad land, 'way up yonder, With the forests where silence has lease, There's the beauty that fills you with wonder, And the stillness that fills you with peace."







Scenes in and about Sacramento

Sacramento, the city beautiful, California's Capital







Plymouth Consolidated Gold Mines, Ltd., Amador County, California

CALIFORNIA MINERAL INDUSTRY

Leads In Production Of Gold, Platinum, Quicksilver And Borax—58 Counties Produce Minerals—Workable Coal Area 500 Square Miles—31 Counties Are Gold Producers

ALIFORNIA, with its fifty-eight counties comprising an area of 158,360 square miles, produces a larger variety of minerals commercially than any equal area in the world. Every county produces to some extent towards the state's output of mineral wealth which consists of fifty-three commercial minerals not segregating the many varieties of gem and miscellaneous stones.

The annual production figures vary greatly from year to year due to the demands for certain minerals at various times and also the fluctuating value of the minerals.

The total value for the year 1923 was approximately \$328,500,000, being an increase of over \$83,300,000 from 1922 production of \$245,183,826 and surpasses our previous high record set in 1921 by more than \$60,000,000. The salient features of 1923 compared with the preceding year were: the continued increase in petroleum yield although with a lower price per barrel; increases in copper, cement, lead, natural gas, brick and tile, and crushed rock; and decrease in gold and silver values. The net result was an approximate increase of eighty-three million, while petroleum prices accounted for an increase of approximately sixty-nine million over 1922 and with an increase in quantity of approximately 124,000,000

It is difficult to discuss briefly and intelligently an industry so important and at the same time so diversified. Roughly classified, the commercial minerals of the state may be grouped as fuels, metals, structural materials. industrial material and salines. Each group will be briefly mentioned.

By LLOYD L. ROOT *

FUELS

The fuels include coal, natural gas and petroleum, which are by far the state's most valuable mineral products, as measured by the dollar. Together they formed in 1923, 77 percent of the state's mineral output.

Coal, which was first mined in 1847 in San Louis Obispo County, is known to exist in forty-three counties of the state. Many deposits with extensive surface showings have had no work done on them. Coal production was a factor in the mineral industry of California from 1860 on until the production of petroleum, the largest part being mined from the deposits north of Mt. Diablo, Contra Costa County; Corral Hollow, which lies on both sides of the divide between Livermore Valley and the San Joaquin Valley; Ione field in the Sierra Nevada foothills, Amador County; Stone Canyon, Monterey County, and near Elsinore at the eastern base of the Sierra de Santa Ana, Riverside County.

The United States Geological Survey estimates that the workable coal area of the state is 500 square miles and the original contents of all fields one billion short tons (1,000,000,000). The total production to date is 5,177,125 tons, equivalent to an exhaustion of approximately 7,000,000 tons or seven-tenths of one percent of the original supply.

With the present prices and production of crude petroleum, coal has been badly neglected, but recently there has been a renewed activity in some of our coal areas: drilling in the Ione Field, Amador County; and some work at Tesla, Alameda County; Stone Canyon, Monterey County; and Palo Cedro, Shasta County. The most recent and what looks to be the largest development is the coal area at Dos Rios, Mendocino County. Here they have succeeded in opening up a 14-foot bed of sub-bituminous coal of good grade.

The first economic use of natural gas in California was made from the Court House well in Stockton in 1854-1858.

The largest fields were until recently in Kern County, but the new fields at Santa Fe Springs, Huntington Beach and Signal Hill in Long Beach are at present the largest producers. Other counties that produce large quantities of natural gas are Orange, Los Angeles, Ventura and Santa Barbara.

The production of natural gas for the year 1923 was 115,000,000 M. cu. 1922 production of 103,628,027 M. cu. was an increase of 12,000,000 M. cu. ft., and value of \$585,000 over the ft., with a value of \$7,475,000, which ft. and value of \$6,990,030.



Mt. Shasta

Natural gases which are being used range in heat values from 850 to 1,200 b. t. u., being higher than those of the manufactured gases. A large part of the gasoline produced in the state is being recovered from these gases.

Petroleum, the largest single item in value on the list, needs little comment. California at present using January-March statistics has produced 60,166,988 barrels as compared to 52,492,396 barrels for same period in 1923. There is a gradual decrease in the daily production and it will doubtless show a decrease for the year 1924.

The following figures for the state in the month of March were:

Long Beach	Barrels 6,104,570
Santa Fe Springs	2,682,741
Huntington Beach	1,733,090
Elk Hills	1,189,088
Rest of state	5,187,072
Total	19,913,262

The state's daily production for week ending May 17, was 639,700; May 24, was 641,500.

There were in March 10,549 producing wells, as compared to 10,283 producing wells for February.

Los Angeles Basin area, the largest producing area in the state, showed as follows for the weeks ending May 17 and May 24:

Los Angeles Basin Area-Estimated daily production:

\$4,218,633,000 and from California in the same period \$1,763,843,269. The United States production for 1923 \$51,278,000. Colorado came second with one-half as much as California, or \$6,501,200. Apparently the reduction was due to a decrease in the output of the deep mines, for the dredges, which normally yield 90 percent of the placer bullion, were more productive than in 1922. Several of the larger deep gold mines in the state were not operated at full capacity during the year. Consid-



Emerald Bay, Lake Tahoe

erable work was done in developing gold veins in the Alleghany district, Sierra County, and the Grass Valley district, Nevada County, and both districts will

Bbls.

175,520 72,750

66.800

49,530 output as

compared with 1922.

Copper is the second on the list of metals in production value. In 1923 California produced 27,698,300 pounds with a value of \$3,942,000, as compared to 1922 production of 22,883,987 pounds with a value of \$3,090,582. This great increase was due not only to the enlargement of operations of the Engels and Walker mines, but to the resumption of mining and smelting in the Shasta district. The Mountain copper smelter was in operation four months prior to December, and the United States smelter at Kennett was blown in late in November. The Calaveras Copper Co. made preparations to reopen its smelter at Copperopolis but did no smelting in 1923.

Silver comes third to gold in production this year with a total of \$2,918,743, the principal part of this coming from the Randsburg district, San Bernardino County, Inyo and Plumas Counties. The silver produced in 1923 is estimated at 3,559,442 ounces, over 345,000 ounces more than in 1922. This slight increase is due to the silver obtained from the copper and lead ores. The Kelly mine, at Randsburg, maintains its preeminence as a silver producer, not only in California but in the United States.

Lead has taken a decided jump with a production of 8,400,700 pounds, valued at \$605,000, as against 6,511,280 pounds with a value of \$358,120. The largest producers were Tecapa and Darwin mines in Inyo County. All the output

was made by properties in Inyo and San Bernardino Counties.

Quicksilver, one of the first metals mined in California, starting in 1824, increased slightly to 5,458 flasks with a value of \$332,851 in 1923, over the 1922 production of 3,466 flasks valued at \$191,851. This production is approximately 70 percent of the quicksilver produced in the United States. It comes from 13 counties, the principal ones being San Benito, Santa Clara and San Luis Obispo.

Zinc is another metal that has come to the front with a production of 3,034,430 pounds valued at \$172,-963 in 1922, as compared with the 1921 production of 846,184 pounds valued at \$42,309, the production coming practically all from Shasta County, though a small amount was produced from Inyo County. There was

apparently no production for 1923. Platinum and allied metals produced in California represent 96 percent of the United States production with 578 crude ounces at a value of \$100,000. This production comes from Butte, Calaveras, Sacramento and Yuba Counties with the dredge work, while that produced from hydraulic and placer mining comes from Del Norte, Humboldt, Siskiyou and Trinity Counties.

Iron ores are known to exist in several counties of the state, the principal deposits being in Shasta, Madera, Placer, Riverside, San Bernardino and Mendocino. The lack of cheap coke makes it impossible to use these ores commercially. There is a good future in the iron steel industry in this state when coke can be secured economically.

STRUCTURAL MATERIALS

The mineral substances in this group are those more or less directly used in building and structural work. They consist of cement, asphalt and bituminous rock; brick and tile, chromite, granite, lime, magnesite, marble, onyx, sandstone, slates and other miscellaneous stone, including paving blocks, grinding mill pebbles, sand and gravel, and crushed rock.

Cement is the largest single item on this list and although it increased from 8,962,135 barrels in 1922 to 10,825,405

	Week end Wells	ling May 17t Bbls.	th Wells	lay 24th Bbla
Long Beach	417	183,600	418	175,5
Santa Fe Springs		73,800	342	72,7
Torrence & Dominguez		68,100	297	66.8
Huntington Beach		49,100	268	49,5
The production for 1923 was	probably	show an	incressed	outnut

262,875,690 barrels with a value of \$242,731,309, an increase in barrel production of 124,407,468 and an increase in value of \$69,350,044 as compared to the 1922 production of 138,468,222 barrels with a value of \$173,381,265.

The leading counties contributing to this total are Kern, Orange, Los Angeles, Fresno, Santa Barbara and Ventura. The total proved oil lands in the state consist of 112,761 acres.

METALS

Thirty-one of the fifty-eight counties of the state contribute to the gold producing list for the year 1923.

The 1923 production of California was \$13,379,013, a decrease of \$1,300,000 from the 1922 production of \$14,670,346 but at that California is the leading state in the United States in gold, producing approximately 27 percent of that metal. The total gold production of the United States since 1848 has been



Carson Hill Gold Mines, Melones, California

barrels in 1923 or a gain of 1,863,370 barrels, it has increased in value from \$16,524,056 in 1922 to \$25,999,203 in 1923 or a gain of \$9,475,147.

Brick and tile due to increased building throughout the state has increased from \$7,994,991 in 1922 to over \$9,000,000 for 1923.

Miscellaneous stone, comprising crushed rock, sand, gravel and paving blocks, has increased, also due to building conditions, from \$10,377,783 in 1922 to over \$12,000,000 for year 1923.

Magnesite, which California yields about 90 percent of that produced in the United States, has taken a decided jump over last year, due to the use in stucco work in building. The 1922 production was 55,637 tons valued at \$594,665, while 1923 shows a production of 73,963 valued at \$946,000.

There are fifty-five counties of the state that contribute to the above list of minerals.

INDUSTRIAL

The mining of the industrial minerals is carried on a comparatively small scale, due to the demands for the minerals being in most instances for local markets only. There is an increasing demand, and California is in the unique position that she can supply the demand no matter how large the growth.

The minerals under this heading are largely mineral earths and substances used in various chemical industries and manufacturing processes not clearly belonging to the other four sub-divisions.

It includes asbestos, barytes, pottery clay, dolomite, feldspar, fuller's earth, gems, graphite, gypsum, diatomaceoùs earths, limestone, lithia, mineral water, pumice, volcanic ash, pyrites, silica, soapstone and tale.

There were a

number of fluctuations in this group, the more important increases being shown by mineral water, pottery clay, gypsum and pyrite. There has been added to this list two new items not previously produced commercially in California; namely, shale oil and sillimanite.

The leading minerals of this group so far are:

1	Pyrite, 148,004 tons	\$555 306
	Mineral water, 4,276,346 gal-	4000,000
	lons	486,42
3.	Pottery clays, 277,232 tons	473,184
4.	Limestone, 84,382 tons	282,183
5.	Gypsum, 47,084 tons	188,336
	Dolomite, 52,407 tons	

A complete list of all the industries dependent upon the industrial minerals, as we'll as the minerals themselves, would require a larger space than is here available, so we will list only a few of the more important ones and their uses.

Pottery clays, besides being used for pottery ware, enter into the manufacture of paper, cotton goods and various chemicals. Some clays are used extensively in soap manufacture.

Pyrite—the principal use of this mineral is in the manufacture of sulphuric acid; fuller's earth in the filtration and clarifying of vegetable and mineral oils; Dolomite is used as a refractory lining of steel furnaces and in making carbonic acid gas; limestone's use in the industrial group is for agricultural purposes, and is also utilized as foundry flux, in glass and sugar making, chemical and manufacturing processes.

The salines produced in California include borax, common salt, soda, potash and other alkaline salts. Imperial, Inyo, Kern, Los Angeles, San Bernardino and San-Luis Obispo Counties comprise the area containing the principal saline resources.

The common salt produced is obtained by evaporation of sea water at plants located in San Francisco Bay, Monterey Bay, San Diego Bay, and at Long Beach.

About 90 percent of the borax produced in the United States is produced in California. Nevada State is the only other producer. The 1923 production was 66,667 tons of 40 percent anhydrous boric acid equivalent, valued at \$1.893,798.

The 1923 production of common salt was 275,979 tons, valued at \$1,130,670. The production for soda in 1923 was 34,885 tons, valued at \$764,284. Potash has taken a little rise from 17,776 tons, valued at \$584,388 in 1922 to 29,597 tons, valued at 709,836 in 1923. Magnesium salts show an increase from 3,036 tons, valued at \$89,788 in 1922, to 3,662 tons, valued at \$116,620 in 1923.

While there has been a slight drop in monetary value of some of the minerals produced in the state, one can readily see that there has been a gain in production of minerals at a lower price per unit, which tends to show we are getting back to a more stable basis of lower prices.

These authentic figures and records furnish a background from which no

other than an optimistic view of the future of the mining industry can be drawn, and it is evident that, with proper development, the mineral resources of the state are capable of contributing almost indefinitely and in ever-growing variety and amount.



Sutter's Fort, Birthplace of American Settlement in California



GROWTH AND POSSIBILITIES COLORADO MINERALS

Gold Producer Since 1858—A Leader In Silver Production—Marvelous Diversity In Mineral Wealth—Importance Of State As Producer Of Both Metallic And Non-Metallic Minerals Outlined

HOMAS JEFFERSON, in 1803, as Fresident of the United States, paid France \$16,000,000 for the territory that now comprises the United States lying between the west bank of the Mississippi River and the Pacific Ocean. Colorado's real history began in 1806, when Major Pike, in his famous expedition looking for gold, discovered the peak which bears his name.

In 1819, a larger expedition was prepared and ordered to explore the Colorado section of the Rocky Mountains. However, before the year 1858 very little is known about the State of Colorado. In 1852 a party of Cherokee Indians, on their way from Georgia to California, discovered gold on the banks of a small stream tributary to the South Platte. Upon their return to civilization they exhibited their gold, which resulted in the first train of prospectors to attempt the discovery of gold in Colorado. In the year 1860 great mining activity was apparent throughout the mountain region. It was during this year that the Consolidated Ditch, world famous, constructed for mining uses, was completed. The eastern interest and speculation in gold mining began in 1863. Huge sums were raised by eastern stock companies for the promotion of Colorado gold

mines, and from that day on the record of the mining industry of Colorado has been one of steady increase of production, although the product has been variable. Gold was the original basis for the mining industry of the state.

Later it was found that the oxidized ores near the surface would yield a profit, although at that early date silver was considered detrimental. The Boston and Colorado Smelting Works in 1868 established and successfully operated their mill at Black Hawk. It was with the establishment of this mill that silver and copper began to have some intrinsic value and a new era in the state's mining progress was opened. With the advent of the railroad in 1870 came the discovery of rich deposits of gold and silver in the San Juan section. Discovery of lead carbonates, carrying silver, in the Leadville district was in 1874. With silver being a metal to be sought for rather than avoided, Colorado rapidly forged to the front as one of the leading lead-silver producers of the country.

Colorado is richly blessed with mineral wealth. Possibly no state in the Union has such a diversity of minerals as practically every useful mineral has been discovered in quantity in that state. There already have been discovered approximately 250 useful metallic and non-metallic minerals and compounds. The state has steadily produced gold since 1858, and its gold production amounts to approximately \$685,000,000. It has also produced \$515,000,000 in silver. At the present time, zinc ranks second in the annual volume of output, although zinc production did not commence on a commercial scale until 1902. The total value of gold, silver, lead, copper and zinc marketed in Colorado to the beginning of 1924 is approximately \$1,570,000,000.

Tungsten was first discovered in Boulder County in 1900, and has been produced commercially since 1904, and uranium, vanadium and radium have been produced since 1906. Colorado stands in the first rank in the production of these metals. Molybdenum is being produced in considerable quantity at the present time and promises to take an important place in the statistics of the state's mineral output.

According to the United States Geological Survey, the coal fields of Colorado cover approximately 19,750,000 acres and the available coal supply is about 317,500,000,000 tons. This coal ranges in quality from black lignite and sub-bitu-



A Panoramic View of Telluride, Colorado

minous through various grades of bituminous to anthracite.

Colorado has produced crude oil steadily since 1887, the total output of the state being in excess of 12,000,000 barrels. Colorado also has immense deposits of oil shale. These deposits cover an area of 2,000 square miles and the aggregate thickness is approximately 100 feet. Tests by the United States Geological Survey have shown a recovery of from 10 to 68 gallons of petroleum from a ton of shale. It is estimated that the amount of petroleum available from Colorado shale is 20,000,000,000 barrels and that the amount of ammonium sulphates which should be recovered from the same shale by the same process is 300,000,000 tons.

Colorado has an abundance of vast deposits of high-grade stone, among them being sandstone, granite and basalts. It also has rich deposits of marble and limestone. Brick clay is found in practically every county in the state. Fire clay, plastic clay and kaolin are also widely distributed. Among the more important minerals to be found in the state are aluminum, antimony, arsenic, barium, bismuth, cadmium, cerium, cobalt, copper, gold, iron, lead, manganese, mercury, molybdenum, nickel, platinum, silver, tantalum, tellurium, tin, titanium, tungsten, radium, uranium, vanadium and zinc. In the non-metal field, the more important deposits are abrasive stone, amber, asbestos, asphalt, basalt, cement material, corundum, coal, feldspar, fluorspar, Fuller's earth, glass sand, granite, graphite, gypsum, kaolin, limestone, marble, mica, oil shale, onyx, petroleum, potash, sandstone, slate and sulphur.

METAL MINING IN COLORADO IN 1924

HE development and production of metal mines in Colorado during the first six months of 1924, according to the Geological Survey, indicate in this year as compared with 1923 an increase for gold between \$500,000 and \$1,000,000, a decrease for silver of about 500,000 ounces, a decrease for lead of 5,000,000 pounds, little change for copper, and a probable increase for sinc.

Colorado metal mines, according to latest information, produced in 1923, \$6,591,629 in gold, 5,334,488 fine ounces of silver, 4,248,109 pounds of copper, 45,698,185 pounds of lead, and 54,152,000 pounds of zinc, with a total gross calculated value of recoverable metals of \$18,471,590, as compared with \$15,301,698 in 1922, an increase for 1923 of 21 per cent.

During the first six months of 1924 the Cripple Creek district has produced \$2,300,000 in gold, or at the rate of \$4,600,000 a year, as compared with \$4,065,545 in 1923. The output from Cripple Creek for the second six months will probably be higher than that for the

first six months owing to the progress that is being made in the district. The Cresson mine will probably maintain if it does not exceed its regular monthly cutput of 10,000 to 11,000 tons; the Portland mine, now relieved of debt by shipments from its 2,600-foot level and by the profitable operation of its cyanide-concentration mill, will probably be able to combine mining ore and sinking to 3,000 feet; the United Gold Mines Company has opened much ore in its properties; and the reopened Stratton Estate mines may become shippers before the end of the year.

Telluride has shipped bullion to the Denver mint in excess of that shipped during the corresponding period in 1923 and has shipped large quantities of concentrates to the Durango smelter. During part of the period the concentrates from the Black Bear ore added materially to the flow of concentrates from Telluride, but the closing of this property on April 27 and a decrease in the quantity of concentrates made from ore from the Smuggler Union mine indicate a decreased production for San Miguel County. The Black Bear mine, however, may resume operations. In the meantime the Reed-Coolbaugh sulphating plant at Durango is working on stock shipped from the Black Bear from April, 1923, to April, 1924.

Silverton reports regular and heavy shipments of lead concentrate and zinc concentrate from the Sunnyside Mill.

The Iowa-Tiger mine, which was idle during part of 1923, is again shipping. Other properties near Silverton, where mining was so inactive in 1921-22, are being reopened. Development, mining, and shipping have increased somewhat at Rico, Dolores County, and considerable development work has been done near Lake City, Hinsdale County. Silver ore is still being shipped from Creede, Mineral County. A considerably increased quantity of gold ore has been shipped from Hesperus, La Plata County.

The production of Leadville will naturally show a decrease, as the Penrose shaft is idle and the opertions of the Yak tunnel are curtailed, but several of the gold properties have been worked and the unwatering of the Graham Park-Carbonate Hill properties has proceeded steadily, so that production of lead-zinc and lead ores may start from the known ore bodies of that area before January 1, 1925.

Aspen, Pitkin County, will show a greatly decreased production of lead and silver as the Smuggler Leasing Company's mine and mill have been idle since August, 1923. Some work is being done, however, in the

work is being done, however, in the Cowenhoven, Park, Hope, and Newman adits. The shipments of zinc ore from Red Cliff, Eagle County, have been steady.

Park County has a new gold mill at the London mine, and the South Park dredge has been producing steadily.

Zinc-lead ore has been regularly shipped from Whitepine, Gunnison County, and lead and zinc ores have been marketed from Monarch, Chaffee County.

Gold dredges in Summit County have been actively operated, and shipments of lead ore and zinc concentrates from Breckenridge were heavy for the first six months of 1924, but on July 1 the Wellington mills were closed pending

negotiations regarding electric power rates. Kokomo and Montezuma, Summit County, report development work.

Custer County is showing renewed activity, and lead-copper-silver ore is being shipped from the Passiflora mine at Westcliffe and cerusite concentrates from the Terrible mine, at Ilse. Recently operators have begun to move iron-manganese ore from surface workings near Silver Cliff.

Some interesting new finds have been made near Idaho Springs, a new mill has been



Lee, U. S. Geological Survey

Smuggler Mill, Telluride, Colo.

built near Empire, the Freeland tunnel is being operated, and some ore is being produced at Silver Plums, but miners in Clear Creek County are devoting their energies to development work and to reopening idle properties. New development work is being done in several properties in Gilpin County. The mines in Boulder County have not been very active.

As the Rawley mine has been idle since December, 1923, the production of silver, lead, and copper in Saguache County will be considerably less than in 1923. The Colorado Fuel and Iron Company has increased its operations at the Orient mine, near Villagrove.

Fluorspar has been shipped from

Wagon Wheel Gap, Northgale, and Cotopaxi.

Assayers in Denver report more business than they have had for several years and without doubt examinations and inquiries regarding mines are on the increase in the state.

METALS IN NEW MEXICO IN 1924

A STATEMENT issued by the Geological Survey shows that the production of metals in New Mexico during the first half of 1924 showed no great change from the rate of production in 1923, the total output of which year was \$11,573,805—an increase of \$5,675,359 over that of 1922.

In 1923 the mines produced \$551,713 in gold, 747,127 ounces of silver, 61,356,802 pounds of copper, 3,832,427 pounds of lead, and 16,496,000 pounds of zinc.

During the first half of 1924 the Chino division of the Ray Consolidated Copper Company completed the remodeling of four sections of the plant and now reports that the

results of the improvements made have gained all that was expected in economy of cost and increase in recovery. The Chino mines produced 54,261,228 pounds of refined copper in 1923. The Lordsburg district produced in 1923 \$216,554 in gold, 141,538 ounces of silver, 4,314,122 pounds of copper, and 46,185 pounds of lead, having a total value of \$970,024, but the shipment of siliceous ore carrying gold, silver, and copper from this district has not equaled the record for 1923.

A notable increase in the production of gold and silver was made during the first half of 1924 at Mogollon, where the Mogollon Mines Company enlarged its operations by taking over the Fanney mine and mill. The mines in Sierra county continued to contribute smelting

ores carrying silver.

Reports from Magdelena indicate a lessened production of zinc and lead in 1924, but the milling of zinc ore at Hanover appears to continue at about the rate maintained in 1923.

Leather binding on a submerged mine car, which has been under water 57 years at Hazelton, Pa., has been reclaimed and made into a pair of soles for his daughter's shoes by William Hyland, a miner.



Tearing Down Stope on the 2,700 Foot Level, Portland Gold Mine, Cripple Creek, Colorado



Utah Copper Company Plant and Workings, Bingham Canyon, Utah

UTAH'S MINERAL WEALTH

Importance Of Utah As A Mineral Producing State—World's Largest Copper Mine—State Ranks First As Silver Producer—Immense Mineral Possibilities Outlined*

ORE than \$1,000,000 a week is being taken from the ground in Utah, where mining is a chief industry. Since 1868 Utah has been one of the nation's leading metal producing states, its output to date having a value of \$1,350,000,000, from which dividends of approximately \$250,000,000 have been paid by eighty-three companies operating in fifteen separate districts.

The world's biggest open-cut copper mine, the Utah Copper, and the nation's largest silver mines are in Utah. Among the states it ranks first in silver production, third in lead production, fourth in copper production and seventh in the production of gold.

With the development of the mining industry there has grown in Salt Lake Valley the world's largest smelting center, where are located four copper and lead smelting plants that have a total annual capacity for the reduction of 4,500,000 tons of ore.

The industry furnishes 85 percent of the freight traffic originating in the state, and its mines, mills and smelters, furnish employment for 18,000 men, totaling a payroll of approximately \$30,000,000 annually.

The mineral wealth of the state is enormous. Utah has been described by competent engineers as the greatest mineralized area in the world. In addi-

tion to the precious and semi-precious metal deposits there are vast stores of known iron and coal deposits, the world's largest alunite deposits which are rich in potash and aluminum, immeasurable tonnages of oil shales which government reports estimate contain more than 42,800,000,000 barrels of oil and 500,000,000 tons

*Statistics compiled by Salt Lake City Chamber of Commerce. of ammonium sulphate. The world's largest deposits of the hydrocarbons, the annual production being 30,000 tons, gilsonite, elaterite and ozokerite, immense deposits of natural material from which cement is manufactured and all classes of building materials, such as clays, gypsum, building stone, including various colors of marble, are found within the state.

The Carbon County coal deposits are rated as the largest and best grade of bituminous coal in the country. It is estimated that the coal resources of the state, which are producing at the rate of nearly 5,000,000 tons annually, are about 11.008.864.000 tons.

The value of this great coal store, the great iron deposits and mountains of limestone, for the development of a steel industry has only recently drawn the required capital for such an enterprise, and now \$10,000,000 is being expended to build what promises to be an industry to supply iron and steel needs of the West.

Active drilling operations are going on in several parts of Utah, and indications are encouraging that oil will be found in commercial quantities in several districts. At Farnham and Woodside, in Carbon County, drilling is going on by the Utah Oil Refining Company, and geologists assert the outlook is exceptionally good. Both are closed struc-

tures. The saturated sands which caused excitement at San Rafael, in Utah, a few years ago are the sands that are the objective at Woodside and Farnham. San Juan County has oil in small quantities, but, if the proper structure is found, there will be oil in commercial quantities. The Coalville district, in Summit County, is a good prospect, the horizon being the same as that which furnishes oil in southwestern Wyoming.

Approximately \$2,000,000 have been spent exploring for oil in Utah, and if oil is discovered in the anticipated quantity this state will enjoy a boom.

MINING HISTORY

Mining history in Utah dates back to the early fifties when lead ore was being mined in Beaver County to supply the "Mormon" pioneers. Development of mines was not urged on the pioneers, however, so that the exploration for metal deposits did not become important until 1862 when Gen. E. P. Conner, with a troup of California volunteers, established Camp Douglas, overlooking Salt Lake City. The mountains surrounding Salt Lake Valley were an inviting prospecting field for those soldiers, many of whom had been lured to California by the gold rush.

Their first ore discovery was made in the summer of 1862 in the mountain

> range to the west of Salt Lake Valley, in what now is known as Bingham. Two years later these soldiers, ranging over the hills to the south of Bingham, discovered the Ophir district, and others of the prospectors, taking to the hills east of the valley, found rich lead ore in Little Cottonwood Can-As these earlier yon. districts were fully located the prospectors ranged



Boutwell, U. S. Geol. Surve

Silver King Mine, Utah

farther into the hills, and in turn the great Park City camps were discovered within the next six years. Numerous outlying camps, many of great wealth, were located later.

Although ore production has been made continuously since the first discoveries, it is important to note that all of the first mining camps of the state are to this date important producers, and the lateral extent or depth of commercial ore deposition has not yet been determined in the main districts. In recent years new mines now producing at the rate of \$1,000,000 annually have been opened in outlying areas.

MINERAL WEALTH PRODUCED, 1865 TO CLOSE OF 1922

Salt	\$ 8,987,622
Cement	17,050,854
Clay products	16,438,150
Zinc	18,814,452
Gold	104,213,935
Coal	223,352,652
Lead	229,049,639
Silver	341,052,727
Copper	457,933,446

In addition to the principal coal mining companies listed below, there are bundreds of other coal properties owned by individuals and corporations which contain valuable deposits but which are not at the present time actively producing.

Utah Fuel Co.
U. S. Fuel Co.
Standard Fuel Co.
Independent Coal &
Coke Co.
Spring Canyon
Coal Co.

Cameron Coal Co.

Carbon Fuel Co.
Kinney Coal Co.
American Fuel Co.
Liberty Fuel Co.
Peerless Coal Co.
Lion Coal Co.
Knight Coal Co.
Mutual Coal Co.

One-fifth of the state is underlaid by coal. If all the coal in Utah which the United States Geological Survey has estimated could be loaded into cars averaging 40 tons to the car, it would

make a solid train that would girdle the earth at the equator 304 times.

Coal deposits in the Ruhr basin are of sufficient extent to employ constantly 500,000 miners and will produce coal for many generations to come, but the Utah coal deposits are so much greater in extent that geologists believe that not until the Ruhr basin coal measures are exhausted will coal production in Utah have reached the peak, and after that time there will be sufficient coal to last the entire world for several hundred years.

The coal mined in Utah up to the present time would cover a space of 49 square miles to a depth of 66 feet. This amount is 74,-450,884 tons. This represents only 1 percent of the original coal deposits in the state. To mine this has taken 30 years, so the duration of Utah's coal production may be easily computed.

MINERALS FOUND IN UTAH

Rich in history of mines, Utah still affords great opportunity of making new great producers of metals, her wealth consisting of deposits of:

Agate, alum minerals, alunite, andradite, anglesite, anhydrite, antimony, argentite, arsenic, arsenobismite, arsenopyrite, asphalt, aurichalcite, autunite, azurite, azurmalachite.

Barite, basalt, beaverite, bentonite, beryl, bindheimite, binnite, bismuth, bismuth arsenate, bismutite, bituminous rock, bornite, brochantite, brown iron ore.

Calamine, calciovolborthite, caliche, carnotite, celestite, cement material, cerargyrite, cerium, cerusite, cervantite, chalcedony, chalcocite, chalcopyrite, chalcotrichite, chrysocolla, cinnabar, clays, coal, coke (native), conichalcite, copper, corkite, cosalite, covellite, cuprite.

Diatomaceous earth, dufrenoysite, elaterite, "enargite, epsomite, feldspar, galena, garnet, gas, gilsonite, gold, granite, gypsum, hematite, hubernite, hyalite, hydrozincite, infusorial earth, iron, jamesonite, jarosite, jasper, kaolinite, lead, leadhillite, lettsomite, limestone, limonite, linarite, magnetite, malachite, manganese ore, marble, marl, matahewettite, mercury, mimetite, minium, mirabilite, mixite, molybdenum, molybdenite, monazite.

Natural gas, nigrate, niter, obsidian, oil, oil shale, olivenite, onofrite, onyx marble, opal, orpiment, ozokerite, pearceite, petroleum, phosphate rock, pisanite, pitchblende, platinum, plumbojarosite, porphyry, potash, proustite, pumice.

pyragyrite, pyrite, pyrolusite, pyromorphite, pyrope.

Quicksilver, radium, realgar, rhodochrosite, rhodonite, road metal, salt, sand and gravel, sandstone, sheelite, scorodite, shale, silver, slate, smithsonite, specularite, sphalerite, stibnite, strontium, sulphur.

Tabbyite, tenorite, tetradymite, tetrahedrite, thorium, tiemannite, topaz, torbernite, travertine, tufa, tungsten ores, tyuyamunite.

Uintaite, uraninite, uranium, uranospinite, uvanite, vanadium, variscite, volcanic ash, whitstone, weidgerite, willemite, wolframite, wood, wulfenite, wurtzilite, wurtzite, zeunerite, zinc.

ALUM FROM CLAY

WHAT is believed to be a muchneeded simple, cheap method for the
manufacture of pure alum and aluminum salts from impure clays has been
devised by Department of the Interior
investigators attached to the Pacific
Experiment Station of the Bureau of
Mines at Berkeley, Calif. The process,
when perfected, should replace present
methods in which pure salts cost about
twice as much as impure salts.

Large scale tests on the preparation of aluminum sulphate have been completed by the Bureau of Mines. In these tests, using a unit charge of one ton, the results confirm the conclusions drawn from 100-pound runs previously made, in that it is practicable by a preliminary treatment with acid to remove the iron to a mere trace and most of the potash. This leaves an iron-free residue which can be worked up into aluminum sulphate. Alunite consists of aluminum and potassium sulphates, with iron and other minerals present as impurities. Removal of the iron has been the most difficult problem. Experiments are being continued with the object of determining the best conditions of temperature, pressure and other factors for

maximum efficiency of the process.



Boutwell, U. S. Geol. Survey

Mines in Upper Ontario Canyon, Park City District, Utah

American interests have acquired the Llallagua and Uncia tin properties and the Machaca Marca Uncia Railroad in Bolivia, at a cost of \$27,000,000, the largest single investment of capital in that country, according to a report of the Department of Commerce. They produce 50 percent of Bolivia's tin.

An American company has struck oil in the Department of Tarija and is obtaining a production of 150 barrels per day.

THE MINING INDUSTRY AND MINERAL RESOURCES OF NEW MEXICO

History Of Development—Value Of Products—Future Of State As Producer—Large Deposits Copper, Coal, Lead, Zinc And Silver—Oil Possibilities

By E. H. WELLS *

URING the century following the discovery of America the Spaniards in their search for gold and other things of value sent a number of expeditions into New Mexico. The early explorers found very little gold but occasionally observed turquoise in the possession of the natives. It is quite likely that the turquoise quarries in the Los Cerrillos Hills near Albuquerque were excavated prior to the advent of the Spaniards, and possibly the turquoise deposits of the Burro Mountains and the Hachita Range were worked about the same time.

The great copper deposits at Santa Rita, Grant County, first came to the

attention of the Spaniards in 1800 when the croppings of native copper were pointed out to Col. José Manuel Carrasco by an Indian in return for some service rendered. Apparently the Indians had previously dug up and utilized some of the exposed metal. Mining by the Spaniards started in 1801, and with minor interruptions it continued on a relatively small scale until the steam shovel operations of the Chino Copper Company began in 1910. The only underground metal mining in the United States antedating the operations at Santa Rita was at the Michigan native copper deposits.

Part of the copper mined in the nineteenth century was transported on mules to Mexico City, and later it was hauled 700 miles by wagon to the then nearest railroad shipping point, Trinidad, Colo.

The era of placer mining in New Mexico followed the discovery of the old placers in the Oritz Mountains south of Santa Fe in 1828, this constituting the first authentic placer mining in the United States west of the Mississippi River. The Oritz gold quartz veins near the Old Placers were worked as early as 1833, but mining operations were spasmodic and rather unimportant for the next twenty-five years. In 1859 or 1860 placer gold was found at Pinos Altos, Grant County, and vein deposits were uncovered a few months later. The silver-lead deposits of the Magdalena Mountains, Socorro County, were located in 1866. In 1877 placer gold and gold quartz veins were found near Hillsboro, Sierra County, and in 1878 the rich silver

deposits of Lake Valley, Sierra County, were discovered. Prospectors developed gold-silver ore in the Mogollon district, Catron County, in 1875.

The construction of the Southern Pacific and Atchison, Topeka & Santa Fe railway lines through the state in the early eighties brought a large influx of prospectors and miners, and the discovery or development of many of the important mining districts belong to that period. Silver was the most popular metal. Rich silver ores were mined at Chloride Flat and Georgetown in Grant County, and in



Phelps-Dodge Mine Plant, Tyrone, New Mexico

the Hermosa, Kingston and Apache districts of Sierra County. Most of these deposits were superficial in character and were soon exhausted. The fall in the price of silver about that time seriously depressed the industry, and during the closing years of the nineteenth century mining operations were unimportant.

About the year 1900 mining experienced another revival, accompanied by an increased demand for the base metals including copper, lead, and zinc. The lead ores of the Magdalena district were observed to be associated with high grade zinc ores which yielded a steady production until after the close of the Great War.

The modern history of the mining at Santa Rita dates back to 1897 when the Hearst Syndicate acquired the Santa Rita mines under lease and bond. In 1899 they were sold to a group of men identified with the Anaconda Copper Company, who retained control until The Chino Copper Company,

organized that year, was largely the result of two reports on the property by Mr. J. M. Sully, the present general manager, issued in 1906 and 1908, which made known the existence of many millions of tons of low-grade steam-shovel ore similar to that which was proving to be so profitable at Bingham, Utah. From 1911 to 1920 inclusive the total copper production of the Chino mines was 512,-000,000 pounds of copper, and dividends during that period amounted to \$29,-900,000. About a year ago the property of the Chino Copper Company was taken over by the Ray Consolidated Copper Company of Arizona and is now the Chino Branch of that company.

During the past fourteen years the Burro Mountain mine of the Phelps Dodge Corporation has become one of New Mexico's largest copper mines. Its concentrating mill has a capacity of 2,000 tons of ore per day. Operations have not been resumed as yet since the closing down of the property in 1921. The mining camp of the company at Tyrone is one of the most beautiful in the entire West. The mines of the Mogollon district have been consolidated into one large property known as the Mogollon Mines Company. The Aztec gold mine at Baldy, near Santa Fe, has been worked inter-

mittently and the Empire Zinc Company has mined a large tonnage of zinc ore near Hanover, Grant County. Numerous other developments could be noted if

space permitted.

Coal has been mined in New Mexico for many years. There has been m gradual increase in the value of the coulproduction until now it ranks first in value among the mineral products of the: state. Coking ovens were operated extensively in the period from 1908 to 1920, but during the last three years the coke industry has slackened somewhat.

The total yearly value of New Mexico mineral products has fluctuated widely in the past few years. According to the United States Geological Survey it attained a maximum of \$43,312,947 in 1917, reached a recent minimum figure of \$13,227,268 in 1921, and increased to 18.038.022 in 1922. During the present year it will probably be in the neighborhood of \$23,000,000.

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METAL

Copper—The value of the copper mined in New Mexico in 1920 was \$10,-009,727. The 1923 production, while slightly greater in quantity, had a value of several million dollars less on account of the decrease in price.

Ordinarily the Chino mines of the Ray Consolidated Copper Company provide 85 to 90 per cent of the state's copper. The estimates of the company show 101,163,113 tons of ore unmined. When operating, the Burro Mountain mines of the Phelps Dodge Corporation rank second to the Chino mines in production. Known ore reserves amount to about 7,000,000 tons with a copper content of 2.0 per cent or more. Important amounts of copper ore are being mined in the Lordsburg district in Hildago County.

Silver—The Mogollon mines yield about half of the silver now produced in New Mexico, and some of the ores from the Lordsburg district are rich in silver. A number of silver-lead districts of moderate importance have added appreciable quantities of silver as well as lead to the state's production. Silver sold in 1923 had a value of \$605.048.

Zinc—Only two districts have been important producers of zinc during the past few years—the Central district in Grant County and the Magdalena district in Socorro County. At the mines of the Empire Zinc Company in the former district the ore reserves are sufficient to last for a long period.

Iron—The productive iron deposits are in the vicinity of Hanover and Fierro, Grant County. Very little of the ore available has been mined. The leading property is the Hanover Bessemer Iron and Copper mine, recently acquired by the U. S. Smelting, Refining and Mining Company. The annual production amounts to about half a million dollars.

Gold—Gold in New Mexico is obtained both from placers and underground mines. The placer production, formerly very important, has dwindled in recent years to insignificant proportions. Lode mining has been carried on in many districts but few mines have become big producers.

In the ores of the Mogollon district gold constitutes about 30 per cent of the value. The Santa Rita and Lordsburg ores owe a small part of their value to the gold content. In 1923 gold amounted in value to \$490,500.

Lead—Ores of lead, usually argentiferous, have been mined in a number of districts and some mines have a fair record as producers. In no instance is the present yield large.

Manganese—Deposits of high-grade manganese ore are numerous, but with very few exceptions they are small. Large deposits of manganiferous iron ore near Silver City have been mined intermittently and are capable of affording an

excellent future tonnage, possibly in excess of 1,000,000 tons.

Minor Metals-In Santa Fe and Mora Counties several deposits of molybdenum are known and some ore has been marketed. Tungsten deposits in various localities have been mined on a small scale. Tin in placers and veins is found on the west side of the Black Range in Sierra and Socorro Counties, but the deposits as yet have failed to prove of any value. Vanadium occurs with lead in several districts in the southwestern part of the state and in Torrance County as a vanadate of copper. The radium mineral, carnotite, has been observed in small quantities near Scholle, Torrance County, and in the northwestern part of New Mexico. The radium bearing torbernite occurs in deposits of unproved value in the White Signal district near Silver City.

NON-METALLIC MINERALS

Building and Road Materials—The aggregate annual value of clay products, lime, sand, gravel, and stone for the past few years has averaged a little less than \$1,000,000. In all cases the deposits are inexhaustible.

Fluorite—Although mined only recently fluorite has become a valuable mineral product, bringing \$101,460 in 1920. The possibilities for an increased future production are fairly good.

Salt and Gypsum—These minerals occur in New Mexico in stupendous quantities in the great salt and gypsum bearing series of Permian sedimentary beds of the southeastern part. Some potassium chloride is associated with the sodium chloride. Salt is also found in several deposits, and the "White Sands" of Otero County consist mainly of

Turquoise—Many years ago the annual production of turquoise from deposits in the state had a notable value, but very little has been mined recently.

Minor Non-metallic Minerals-Mica deposits north of Santa Fe have contributed in small part to recent mineral production. Some of the mica is of excellent quality, but there has been little profit realized from past operations. Lithium ore of salable grade occurs near Dixon, Taos County. Graphite derived from coal by the heat of igneous intrusions is found near Raton in Colfax County. On the upper Gila River in Grant County are large and promising deposits of natural alum, and alum beds are reported in Mora County. Several interesting but probably valueless occurrences of meershaum have been noted near Silver City. In Dona Ana County are deposits of sodium sulphate. Numerous mineral springs are reputed to be effective in the cure of various diseases, and artesian water has been developed in places by drilling, notably in the Pecos Valley.

HYDROCARBONS

Coal—Most of the coal deposits of New Mexico are located in the northern part. They are included in two great coal fields—the San Juan Basin coal field lying mainly in McKinley, San Juan, and Rio Arriba Counties, and the Raton Mesa field in Colfax County.

The Raton Mesa field is the most important in the state on the basis of production, affording 65 per cent of the total in 1922. The coal is bituminous and makes excellent coke. McKinley County in 1922 yielded 23 per cent of New Mexico's production from the San Juan Basin deposits. Most of the San Juan Basin coal is classed as sub-bituminous, but is a very satisfactory fuel.

The smaller fields include the Los Cerillos field in Santa Fe County, the Carthage field in Socorro County, and the Capitan field in Lincoln County. The Los Cerrillos field has supplied for many years a moderate tonnage of anthracite coal, and Carthage coal in addition to having an unusually high heat value has good coking properties.

The total coal reserves of New Mexico have been estimated to be in the neighborhood of 175 billions of tons or enough to last for 50,000 years at the present rate of utilization. The production had a value of \$13,568,000 in 1920, but has fallen slightly below that figure during the following years.

Oil and Gas—Oil was first found in New Mexico in encouraging amounts in the Brown well near Dayton, Eddy County, in 1909. The presence of oil in a number of wells in the Seven Lakes district of McKinley County has been known for some years, but like the Brown well their individual production has been negligible. Following the discovery of oil in Eddy County and again during the boom of 1918-20 deep tests were made in various parts of the state, but no valuable oil pools were located.

In 1922 a drilling campaign by the Midwest Refining Company on the Hogback structure in San Juan County in the northwestern part of the state developed a good sized pool of phenomenally high-grade oil. A production of 800 to 1,000 barrels per day is credited to several wells. Oil in commercial quantities is also known definitely to be present at the Shiprock or Rattlesnake structure in San Juan County. Quite recently the efforts of the Illinois Producers Company to find oil in Eddy County in the southeastern part of the state have been rewarded by bringing in a very promising well of unproved capacity not many miles from the old Brown well.

In a few wells drilled for oil gas has been found in considerable quantities, notably near Farmington, Aztec, and La Plata, San Juan County, and in the Roswell section.

ARIZONA—PRODUCER OF MINERAL WEALTH

History Of Early Development of Mining In State—Review Of Past Accomplishment And Future Prospects

T may be truthfully said that the history of Arizona is practically a history of mining in that state. In Arizona, as in California, the "thirst for gold" led to the occupation and domination of the country. Mining preceded agriculture and made it a profitable industry.

"The mines of Arizona, varied and numberless, are no doubt the sources of the future wealth of the Territory and consist of gold, silver, lead, copper, coal, salt and perhaps of other valuable minerals. These mines, especially those of precious metals and of copper and lead, are of wonderful extent and richness and are destined at no distant day to astonish the world by the immensity of their product." The foregoing paragraph is quoted from a book published in 1877 by H. C. Hodge.

The mineral output of this state has run true to this prediction and continues to contribute heavily to the large mineral production figures of the United States.

Since 1910 Arizona has been the largest producer of copper in this country and since 1900 has produced over one third of the total output. Gold production was dominant and largest when that industry was young, and even now the Arizona output compares favorably with that of the other states. Silver mining in Arizona has been traced back to the sixteenth century, when the Jesuit missionaries from Spain employed Mexicans and Indians to extract the white metal from the earth. The name Arizona itself is claimed by some authorities to have come from "Arizuma," which is Spanish for "silver-bearing." At present the state is seventh in the production of silver.

Evidences of pre-historic mining are numerous throughout the mountain regions. While the metals were not put to any useful purpose by the aborigines, it appears that they were valued sufficiently

as ornaments to warrant their extraction in spite of the difficulties incident to the crude methods used.

Stories of wonderful wealth in gold and silver and precious stones of more value than gold fired the imaginations of the Spanish explorer Cortez and his followers, and led to the organization of successive parties of exploration.

The chief valleys where water, wood and grass could be found, were of necessity the chief routes of travel of the early pioneer explorers. Thus the Rio Grande, the San Pedro and the Santa Cruz became the great highways of travel in those early days as now.

The Valley of the Santa Cruz leading to the great valley of the Gila and so into the heart of what is now Arizona, made exploration comparatively easy. Finding the mountains on either side ribbed with silver-bearing and gold-bearing lodes, the prospectors established camps. The Jesuit fathers located in this fertile valley and are credited with having been of great service to the early prospectors, by instructing them in the art of smelting. And a home market for silver produced was immediately provided, as the metal was lavishly used for the adornment of churches.

Veins of silver ore in the Salero mountains on the east side of the Santa Cruz were early developed by surface workings. The ores from these veins were taken to Tucumcacori on the river bank where they were smelted under the shadow of the early mission churches. The name Salero comes from the incident of the visit of a bishop for whose table a large silver salt-cellar was cast from the silver smelted from the mountain. The ancient mine from which this silver came was known as the "Tucumcacori" and is believed to be the same mine worked later by the Salero Mines Co., and from which much high grade silver was taken.

The first attempts at mining by the

early American settlers were greatly handicapped by the hostilities of the Apache Indians. Mining in Arizona was a risky business on this account as late as 1874. In that year Commissioner Safford, reporting on the mineral resources of the state, declared that: "Owing to the various causes, principally Indian hostilities, this vast wealth has been but little developed, and is yet but imperfectly understood."

Between 1790 and 1815 while the Apaches were comparatively at peace, mines were worked on a small scale in several parts of what is now Pima county. With Mexican independence in 1815, and a renewal of Apache raids, the mining as an industry was entirely suspended.

The stories of the hidden wealth of this territory remained and multiplied, and on the consummation of the Gadsden purchase in 1854, mining and prospecting was started in several sections. Eastern capital was enlisted; several mining companies were formed; mills and furnaces were put in operation; and for some six years, in the face of great obstacles the southern silver mines were worked with considerable success and brilliant prospects.

With the coming of the Civil War, however, the troops which had been guarding the inhabitants of this district were withdrawn, resulting in another Apache outbreak. The mining properties were then plundered and destroyed, many miners were killed, and work was again suspended.

The period from 1860 to 1874 saw a campaign carried on by the Apaches to drive out the settlers. By nature and the education of centuries, they were murderous thieves, and looked forward to a life-long struggle with the whites as a natural struggle and their only means of subsistence.

The Apache country proper was that part of Arizona lying east of the Santa



General View Miami Copper Company's Property, Miami, Arizona

Cruz in the south, and of the Verde in the north. As the frontier became settled, the war was extended to the northwest; and with the disaffection of other tribes of Indians, mainly caused by outrages of the whites, the field of hostilities was widened to a considerable distance west of Prescott.

During this period about 1,000 men, women and children were murdered by the Apaches, while approximately 2,000 Apaches were killed. The loss of livestock and destruction of property was great, and all real progress in the territory was prevented.

While troubles with the Indians were discouraging, there were other difficulties of great importance that handicapped the early miner, among them being the problem of transportation, the problem of water supply; and the awkwardness of the crude methods then in use. It was therefore not until the end of the Apache war in 1874 that the expected revival and development of the Arizona mining industry became of importance. Old mines were worked with a profit and many new lodes were brought to light, notably in the central region of Gila and Pinal countries.

Transportation problems were partly solved in the 70's, when two lines of railroad were constructed across the country from east to west.

With adequate transportation, better machinery and lower-priced supplies were to be had, and this proved to be a stimulating factor in all branches of mining.

The valuable minerals were separated from the ore by what was known as the dry washing process, and to pay by this method the mines had to be extremely rich. Later when water was made available at the isolated properties, even the low grade deposits were worked profitably.

From the time marking the coming of the railroads into Arizona to the present day, the story is one of continual growth and extensive development. Discoveries of new ore bodies of astonishing richness caused numerous "gold-rushes." The improvements in mining methods and the invention of new and better machinery resulted in the development of the low-grade ore deposits, and increased the possibilities of the higher-grade properties.

COPPER

During the period of 1854-1861, copper took an important stand in line with gold and silver. The successful working of the Ajo copper mines marked the birth of the copper mining industry of Arizona.

The production of copper ores at Morenci began in 1873, and in 1880 Bisbee became an important producer. At this time the ores of the old silver district at Globe became valuable chiefly for copper. In 1887 production of copper

began at the United Verde mine, in the Verde district. These four districts were producing the larger part of the total of 200,000,000 pounds in 1904, when the Silver Bell district, in Pima county, began its output of copper.

The increase in copper from the several districts continued each year, and in 1911 the Ray Consolidated, in the Mineral Creek district, added its large output, followed in 1917 by the production of the New Cornelia mine in the Ajo district. The maximum was reached by the Arizona mines in 1918, when 764,856,000 pounds of copper was produced, but curtailment was marked from 1919 to 1921. The output of copper in 1923 was 618,928,602 pounds, valued at \$90,982,504, an increase from 400,043,128 pounds in 1922.

GOLD PLACERS

While Arizona is world famous as a copper producing state, it is not generally known that she is a substantial producer of gold. The early prospector discovered placer gold and worked the richest spots with his pan and rocker. There are two main obstacles, however, more or less peculiar to the state of Arizona, that stand in the way of the successful working of these placers; one, lack of water, is a condition common to practically every district in the State; the other, the cementation of the gravel by caliche or lime, is a deterrent in a great number of areas.

It is impossible to state accurately Arizona's total gold and silver production, because most of the gold was obtained at a time when no records were kept, and all the estimates have to be based on information gathered later from pioneers of the various districts. Since 1900 the Geological Survey has collected figures on the placer gold production of the state. The total yield in the twenty year period 1900 to 1920 is placed at \$785,733. The Arizona Bureau of Mines estimates that the total value of the Arizona placer gold production is at least \$50,000,000, which is a conservative figure.

RARE METALS

The fact that base metals have been quoted at relatively low prices since the war has caused many Arizona prospectors to lose interest in them and turn their attention to rare metals.

Vanadium is known to occur in various places throughout the state, but treatment difficulties have handicapped development.

Carnotite deposits, occurring on the Navajo Indian Reservation, have occasionally been reported to the State Bureau of Mines. These deposits occur in the northeastern part of the state. The ore is said to lie in layers that vary in thickness from thin seams up to beds four feet thick.

The market for the rarer metals is ever increasing. Most of the uranium produced is used in the manufacture of high-speed steel. The properties of uranium steel are believed to be identical with those of vanadium steel. The use of radium for therapeutic purposes and the use of low-grade radio-active material in the mixture of a paint that will glow in the dark, are factors which strengthen the market for the rarer metals, indicating the eventual development of the Arizona rare metal deposits.

COAL DEPOSITS

There are three undeveloped coal fields in Arizona, all of which are known to be of considerable value and extent, namely, the Deer Creek, in Pinal County: the Black Mesa, in Coconino, Navajo and Apache Counties; and the deposits near Pindale, Navajo County. These coals are for the most part low-grade, and of local importance, only. However, with the ultimate decline of the New Mexico fields as a source of coke and the possibilities of the utilization of the lower grade coals for gas manufacture, there is a possibility that the hitherto neglected part of the state's resources will some day prove itself of great value.

Arizona's mineral wealth includes deposits of: Alabaster; Andradite; Anglesite; Antimony Ores; Argentite; Arsenopyrite: Asbestos: Azurite: Asurmalachite; Bismuth; Bornite; Brochantite; Brown Iron Ore; Carnotite; Cement Material; Celestite; Cerargyrite; Cerusite; Chalcanthite; Chalcedony; Chalcocite; Chalcopyrite; Chrysocolla; Chrysolite; Chrysoprase; Chrysotile; Cinnabar; Clay (brick, china and fire); Coal (bituminous and sub-bituminous); Copper: Copper Minerals: Coronadite: Covellite; Crocoite; Cuprite; Descloizite; Dufrenoysite; Dyscrasite; Embolite; Fluorspar; Freieslebenite; Gadolinite; Galena; Garnet; Glauberite; Gold (lode and placer); Granite; Graphite; Gypsum; Halite; Hematite (red oxide of iron, micraceous, specular); Hubnerite; Iron Minerals; Jamesonite; Jasper; Kaolin; Lead Minerals; Deadhillite; Limestone; Limonite; Magnetite; Malachite; Manganese; Marble; Melaconite; Mica; Mineral Paint; Mirabilite; Molybdenum; Molybdenite; Muscovite; Obsidian; Olivine Onyx Marble; Opal; Platinum; Polybasite; Proustite; Psilomelane; Pyrargyrite; Pyrite; Pyrolusite; Pyromorphite; Pyrope; Pyrrhotite; Quartzite; Salt; Sand; Sandstone; Scheelite; Serpentine; Silver; Slate; Smithsonite; Specularite; Sphalerite; Stibnite; Stromeyerite; Tenorite; Tetradymite; Tetrahedrite; Thenardite; Tungsten Minerals; Turquoise; Vanadinite; Vanadium Ores; Verde Salt; Volborthite; Wad; Willemite; Wolframite; Wulfenite;

"THE TREASURE STATE"—MONTANA

Leader In Mineral Production Since 1862—Review Of Mining History Of State— More Than Two Billions In Mineral Wealth Already Produced—Future of State Outlined

By C. W. TOWNE*

URING successive periods since its first mineral discovery in 1862, Montana has led all the states in gold, silver, copper or zinc production.

Today she is first in the annual production of zinc, manganese, arsenic and precious stones; is second in the production of silver, third in the output of copper, fourth in lead and eighth in gold.

In gross production her record is even better. The mines of Butte alone have given to the world more copper and more silver than any other district on earth; one-third of all the copper mined in the United States and one-sixth of the world's production of copper to date.

In round figures Montana has yielded more than two billion dollars in mineral wealth, of which \$1,500,000,000 has been left in the state in the form of wages, freight and supplies.

This colossal mineral edifice, known as "The Treasure State," reveals a foundation of gold, a ground floor of silver, an upper story of copper and a zinc roof, with composite interior decorations of coal, oil, lead, arsenic, manganese and sapphires.

When in the spring of 1861 James and Granville Stuart found "colors" in the gravelly bed of Gold Creek and started the stampede that resulted in rich strikes at Bannack, Alder and Last Chance Gulches, they builded better than they knew. In three years Montana was a territory and in 28 years a state.

Montana's placers, from 1862 to 1882, yielded approximately \$200,000,000. Today only a handful of solitary prospectors in remote mountain fastnesses are panning out their \$3 or \$4 a day. The \$500 nuggets turned up by the sour-doughs of 1870 are now almost as scarce as real elk's teeth on a B. P. O. E. watch charm.

Quartz mining, a contemporary of the placers, began with the discovery of the Dacotah Lode near Bannack in Novem-

ber, 1862. Within a few months a mill was set up and put to work, the four stamp stems being made of wood and the shoes and dies of old wagon ties, cut and welded together.

Today most of Montana's gold yield is a by-product of copper, zinc and lead recoveries. In 1915, the state produced its greatest yield,

242,078 ounces, valued at \$5,003,752. It is now producing about 80,000 ounces annually.

The era of silver began in 1865, when a rich vein was discovered in the Travona claim, just west of Butte. Silver development began the following year in the Original mine and a small grinding mill was set up, followed in 1867 by a primitive smelter, which used a blacksmith's bellows for a blast. Really successful silver treatment dates from 1875, when William A. Clark built the Dexter ten-stamp mill in Butte.

Silver smelters were also built and operated at Wickes and Gregory, in Jefferson County. From here silverlead bullion was hauled in freight wagons to the Union Pacific Railroad at Corinne, Utah. The Wickes plant was succeeded by the present works at East Helena, owned by the American Smelting & Refining Company, which treats the larger part of all silver-lead ores mined in Montana.

Montana has produced more than \$350,000,000 worth of silver, the largest output being that of 1918, which amounted to \$16,797,479.

The third, or copper, period in Montana's mineral history began in 1880, when Marcus Daly, backed by Haggin, Hearst and Tevis, deepened the Anaconda Mine at Butte from the 60-foot level to a little more than 100 feet and found, to the consternation of everybody but himself, that instead of silver he had struck copper.

In sharp contrast to the gloom of the old-timers and the pessimism of his partners, Daly was cheerful and optimistic. He contended stubbornly that the hill was rich in copper and urged the purchase of neighboring properties. He insisted that he was going to mine and ship enough high-grade ore to

Swansea, Wales, to secure the money necessary to build a huge smelter, capable of treating the enormous amount of copper ore which he claimed was hidden beneath the rugged contour of Butte Hill.

Every mining engineer west of the Mississippi was skeptical. Half the people of Butte called him a visionary. Some thought he was crazy. Daly persisted. He bought up or leased many other properties, started operations on a big scale, and made Butte the greatest mining camp on earth.

Today three monuments vindicate Daly's vision and faith. One stands opposite the Federal building in Butte. It is a bronze replica of his face and figure, and one of the last masterpieces of August St. Gaudens. Another is the huge Anaconda Reduction Works, the largest non-ferrous smelter in the world. which, incidentally boasts the world's largest smoke stack, nearly 600 feet high. The third is the Anaconda Copper Mining Company, the largest copper mining, smelting, refining and fabricating organization in the world, with 40,000 stockholders and properties in a dozen states and several foreign coun-

Although at the present time Arizona and Utah, with their low cost porphyries, are outstripping Butte in annual copper production, she still retains first place as the nation's largest producer to date. In the forty years since operations were started, Butte has produced 8,500,000,000 pounds of blister copper, or 27 percent of the nation's total output. Her present annual production is about 225,000,000 pounds, or approximately 14 percent of the copper production of the United States.

Within the last ten years Montana initiated and brought to rapid development the fourth stage in her mineral history—that of zinc. Butte Hill was long known to contain important

deposits of zinc ores. But they were so refractory as to be regarded more of a liability than an asset. For years the metallurgists of the Anaconda Company wrestled with the problems of reduction, until finally, in 1916, an electroylytic process was devised whereby the ores could not only be reduced on a satisfactory commercial basis but the resultant grade zinc



Anaconda Plant at Great Falls, Montana

known to commerce-99.9 percent pure.

It is significant that before this process was evolved, thereby saving to Butte an imperilled industry, years of ceaseless effort and \$7,000,000 in cash were expended before the company realized a penny of profit. Courage and enterprise are today being rewarded. Montana's present production of electroyltic zinc is around 160,-000,000 pounds a year, putting her in first place among the zinc producing states.

According to the United States Geological Survey, Montana contains the nation's "greatest, best developed and most available domestic reserves of high grade manganese ore," whose importance came to light during the World War. Requirements of eastern steel-makers for ferro-manganese created the demand. The Butte and Phillipsburg districts of Montana

afforded the supply.

Estimates made in 1918 showed that Phillipsburg contained about 500,000 tons of manganese ore reserves, with nearly as much in sight at Butte. During the four years, 1916-1919, these districts produced close to 300,000 gross tons of manganese ore, thus contributing heavily to the successful manufacture of manganese steel, a prime war necessity. At the present time, chiefly due to available low-priced ore from foreign lands, less domestic manganese is being mined than during the war. However, Montana leads the nation with annual shipments of about 50,000 tons.

The need of white arsenic in large quantities with which to fight the bollweevil blight on southern cotton plantations has stimulated Montana's present day output. About 220 carloads, constituting practically one-half of the national output, are shipped from this state each year.

Unlike the other metals, Montana's production of lead is not confined chiefly to Butte. The state's annual output of some 37,000,000 pounds is gathered from widely scattered areas, whose combined yield places Montana in fourth place among the states producing this metal.

It is reliably stated that America's chief yield of precious stones comes from the sapphire mine of Yogo Gulch, Fergus County, Montana; and that their value represents fully one-half of the national output in precious stones.

Yogo gem stones are acknowledged to be among the finest in the world, excelling the oriental sapphire in evenness of color, radiance under artificial light and perfection in matching The Yogo mine has been operating since 1898 and has produced about \$5,000,000 worth of sapphires. Its present annual produc-



tion is about 500,000 carats of gem stones and 5,000 ounces of stones for mechanical use.

Moss Agates are also found in many sections of the state and are produced commercially in a small way.

Montana's practically inexhaustible supply of limey shale has been exploited by one manufacturer, who quarries and makes into cement some 300,000 tons each year. Two concerns quarry some 50,000 tons of gypsum which is made into plaster and marketed in Montana and nearby states.

Phosphate rock, which is plentiful in this region, is combined with sulphuric acid, an important by-product in treating the local sulphide copper ores, in the manufacture of a treble super-phosphate fertilizer, of which about 10,000 tons were produced last year.

Fifty out of Montana's fifty-four counties yield coal in commercial quantities. The varieties include semi-anthracite, bituminous, semi-bituminous, and lignite. Of all the lignite coal in the country, the United States Geological Survey reports that Montana contains 381,000,000,000 tons, or more than onethird of the nation's total. Annual normal production of all varieties is about 3,000,000 tons, the output in 1917 being raised to 4,226,000 tons. About 95 percent of the output is used within the state, chiefly by the railroad, mining and manufacturing interests.

DISCOVERY OF GOLD

The real development of Montana began with the discovery of gold in commercial quantities. In 1852 a half-breed named Benetsee, who had lived in California, discovered gold on Gold Creek in what is now Powell County. Six years later the Stuart brothers verified the discovery and in 1861 began mining there. About this time gold in paying quantities was found on the Salmon River and its tributaries in Idaho and an immigration from Colorado to the Salmon set in, many of the seekers passing through Montana and prospecting en route. August 16, 1862, John White and others discovered gold on Grasshopper Creek near the old town of Bannack, now in Beaverhead County. Other rich bars were found in the district and mining began in earnest and by January of the following year the town had a population of 500 souls. The fame of the diggings spread throughout the West and gold hunters poured in. Alder Gulch, Madison County, where Virginia City was built, was discovered in the summer of 1863 by William Fairweather's party while returning to Bannack from the Big Horn Mountains in eastern Montana,

having been driven out of the region by the Crows. The next important discovery was Last Chance Gluch, where Helena now stands, in the fall of 1864, by John Cowan. During the next decade in Montana about 500 gold bearing gulches varying from half a mile to 20 miles in length were discovered. The gold production of the territory from 1862 to 1876, inclusive, is estimated at \$144,400,000. The first quartz lode in Montana was the Decotah lode, located near Bannack, November 12, 1862.

Montana's mineral contribution to the world includes gold, produced in twentyone of her counties; coal, possessing some three hundred and eighty-one million tons of lignite; platinum; aluminum; antimony; silver; bismuth; cadmium; chrome; copper; iron; lead; manganese; molybdenum; tungsten; uranium and zinc.

Montana is also a large producer of non-metallic minerals, among which are alabaster, arsenic, asbestos, barite, ben-

In addition to the above she possesses large deposits of pottery clays, corundum, crystalline limestones and marbles, fluorite, fuller's earth, graphite, gypsum, kaolin and mica. Her oil shales are rich and carry immense potential values.

According to figures prepared by the Montana Power Company, this state has produced copper valued at \$1,213,600,000, silver, \$347,399,591; gold, \$189,308,840; zinc, \$126,156,448; coal, \$115,709,645; lead, \$10,487,264; manganese, \$8,732,130; and precious stones, \$2,200,000.

The movement of Alaska copper to market has increased, the July exports to the Tacoma smelters being over 9,900,000 pounds, an increase of 3,500,000 pounds over June.

The Interior is building two steel bridges over the Rio Grande River at the Cochiti and San Juan Indian Pueblos in New Mexico at a cost of \$82,200.

THE AWAKENING OF CRIPPLE CREEK

Portland Gold Mining Company's Rich Strike—Optimism Over Future Of District Apparent—Many Properties Increase Production*

FTER years of lethargy Cripple Creek awoke in December of 1923 to find itself heir apparent to a wealth of riches in the lower levels of mines within the newly created drainage area made possible by the Roosevelt tunnel, through the discovery of rich veins assaying 100 ounces of gold and 65 ounces of silver to the ton on the 2,700-foot level of the Portland Gold Mining Company's mine. This find followed a somewhat similar strike of the year previous on the 2,600-foot level of the same mine which encouraged its owners to carry on an extensive deep level development campaign, now fully instified.

Since the Portland's discovery several rich strikes of equal magnitude have been made on the eighteenth level of the Cresson gold mine. The United Gold Mines group, which includes the Vindicator, also have made rich strikes in the last 12 months, bearing out a prophecy made 25 years ago by an expert geologist, Professor R. F. A. Penrose, to the effect that Cripple Creek would eventually see the return of metal mining operations on a scale unprecedented since the boom days.

Professor Penrose stated at the conclusion of an extensive survey made a quarter of a century ago at the request of the United States Geological Survey, that rich ore would be found in the Cripple Creek district at as great depths as the ingenuity of man could devise in the way of machinery and equipment to take it out.

How this prediction has been borne out

is evident from the recent strikes at great depths which have transformed Cripple Creek from an almost deserted mining camp into a thriving mining community.

Both the Portland and the Cresson have driven to a depth below the Roosevelt drainage tunnel with unprecedented success, the result of which has been to reinvigorate tenfold the metal mining industry in this district.

Eastern capital is being attracted to the Cripple Creek district. Perhaps the most notable example is the recent transaction whereby the properties controlled by the Stratton-Cripple Creek Mining Development Company have been leased to an eastern syndicate headed by W. Spencer Hutchinson and his associates of Boston, Mass. These include many famous mines developed during the lifetime of the late W. S. Stratton, capitalist and philanthropist.

Officials of the Portland Gold Mining Company, including Irving Howbert, president, and J. W. Ady, Jr., managing director, are optimistic over the future of the gold camp and particularly for the company with which they are connected. Mr. Howbert, a member of one of the more conservative groups of bankers in Colorado, recently issued a statement in which he showed that the Portland had cleared more than \$200,000 since January 1, 1924, and that resumption of dividends in the near future could be expected. The company already has paid its stockholders \$12,000,000 in dividends since the early days of its exist-

With the visible supply of shipping ore so large and well defined, 1924 profits

will run to approximately \$1,000,000 from this one mine.

From the 2,700-foot level the main shaft at the Portland is underway to a depth of 3,000 feet, which will be the deepest point ever reached in a Colorado gold mine.

It is interesting to note in this connection that for 1923 the average grade of mill ore was \$3.32 a ton and the average amount treated was 200 tons daily, including mineral from certain outside dumps. And from the Portland Company's mill alone—designated for ore at \$2 and \$4 a ton—the 1924 profits are mentioned in the million-dollar class.

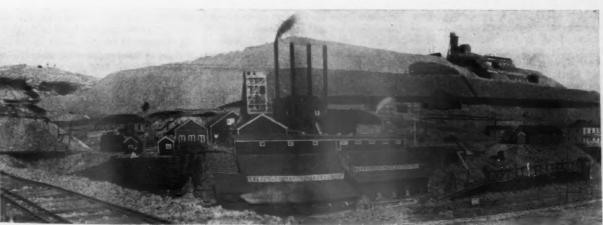
The present capacity of the Portland mill is 400 tons daily, while the average grade of ore is \$6.65 to the ton. Hence the gain in value over the preceding year is 100 percent with no appreciable advance in overhead charges, while the gain in quantity is also 100 percent, which is a very important factor.

Recent developments at the Gold camp since the Portland and Cresson strikes include those at the Gold King, Solomon mine and others. The former has again entered the ranks of producers with rich ore found on the 100-foot level in contrast to the deep level strikes of the other mines. The Solomon mine has uncovered grab samples from a new strike running \$24 to a ton while others show \$60 and \$80 from the streak.

The Cresson, of which A. E. Carlton is the president, is driving down to the 1,800-foot level with every prospect of uncovering rich ore there.

The future of the district as a mineral producer is brighter than for many years.

^{*}Courtesy Jack F. Lawson, Chamber of Commerce, Colorado Springs, Colo.



The Portland Gold Mine at Cripple Creek, Colorado

EARLY DAYS OF THE COEUR D'ALENE MINING DISTRICT

First Mining Location—"Golden Summer Of The Coeur D'Alenes"—Days Of 1883-84—History Of Mineral Development Of State Outlined—Discovery Of Bunker Hill And Sullivan Told By "Dutch Jake"

ORE than one hundred years ago, what is now Idaho was a part of what was known and called the Northwest Territory and claimed by the United States. Great Britain, Spain and Russia also claimed some portion of this wonderful Northwest.

In the year of 1853, Father De Smet, head of the Jesuit Fathers, erected the first Catholic Church in Idaho. Built on the north bank of the Coeur d'Alene River, it stands today a worthy monument to noble deeds well done; in later years the gateway to that wonderful mineral belt known as the Coeur d'Alene Mining District.

An important undertaking and one whose history is closely interwoven with the development of all the Northwest was the construction, during the years of 1859 to 1861, inclusive, of the famous "Mullan Road." This highway extended from Old Fort Walla Walla (now Wallula, Wash.), through the

Coeur d'Alenes, to the head of navigation on the Missouri River at Fort Benton, Montana. In later years appropriate monuments in memory of Captain Mullan were placed along this highway, now known as the Yellowstone Trail.

For twenty years more the restless pioneers passed over this military highway, ever seeking the land of the setting sun, little dreaming of the untold wealth that lay hidden within the Coeur d'Alene Mountains, waiting for the prospector to unlock her doors.

About this time A. J. Prichard, a Colorado prospector, drifted into the district. Mr. Prichard left Colorado in 1877 or 1878 on a prospecting trip through the West, coming to the old Mullan Trail in the summer of 1881. He worked up the South Fork of the Coeur d'Alene River, looking for placer gold. Late in the fall, at a place along this stream, long known as "Evolution," he made the first mining location in this great mining district. Doing some work during the winter of 1881-82, the spring of 1882 found this old prospector making his way over the divide north of the South Fork of the Coeur d'Alene River into an unexplored country, so far as any history gives us. This marked the period known as the "Golden Summer of the Coeur d'Alenes."

On a stream he named Prichard

By EUGENE THOMAS*

Creek, the tributary to the North Fork of the Coeur d'Alene River, Mr. Prichard located several placer claims; one claim in his own name and others in the names of friends who never came to represent them. He wrote his friends to come and



The Bunker Hill & Sullivan Smelter (Lead) at * Kellogg-Wardner, Idaho

keep quiet, but his friends had friends to whom they imparted the secrets of this new Eldorado.

The summer of 1883 saw a stampede to a new gold field in Northern Idaho. All that summer, fall and winter of 1883-84 men came with pack outfits, toboggans and snow shoes, there being no roads or even trails to follow. By the spring of 1884 there were 10,000 or 12,000 men moiling for gold along Prichard Creek and its tributaries. Many of the would-be prospectors and tenderfeet who came ill prepared for such a rigid climate would have suffered for food, especially, had not the Mission Indians established a dog team freight line over what was later known as Trout Creek Trail, charging 25 cents a pound freight. The first team arrived in Eagle City on Prichard Creek in 1883.

The winter of 1883-84 has held the record for the past forty years for deep snows in the Coeur d'Alene Mining District, according to George Heller, now of Kellogg, Idaho, who lived in Eagle City at that time.

The first wagon road was built from the boat landing at Kingston, on the Coeur d'Alene River, to the gold diggings on the east bank of the North Fork of the Coeur d'Alene River to Eagle City, a distance of 28 miles. The construction of this road by McDonald Brothers was started in 1884 and completed in 1885 and cost Shoshone County \$90,000. It was used for freighting, stages and as a mail route, for a few years only, until the road from Thompson Falls on the Northern Pacific Railroad in Montana was completed.

Boats coming from Fort Sherman (now Coeur d'Alene City), over Lake Coeur d'Alene, up the river, landed

freight at Kingston for the new diggings. The restless spirit of the early day prospector could not confine itself to one or two narrow gulches no matter how rich; richer diggings always lay beyond, leading the prospector over divides to Trail and other gulches.

Trail Gulch, in the Placer Gold Belt, is about 4 miles long and one of the rich gulches located in 1883 by Palouse farmers. In 1884 placer miners came in, either buying out original owners or going in with owners as partners to work Trail Gulch claims; every claim paying from mouth to source. Seven or eight hundred men

worked for a couple of years; four to five hundred remained for several years longer, until the placer gold production was reduced below profit. It is estimated that one and one-half million dollars' worth of gold was taken from this short gulch. In the "Myrtle," the first claim opened in this gulch, one pan alone washed out \$186; 4 x 10 feet on bedrock produced \$1,800, placer gold being \$15 per ounce. The claim below the "Myrtle," 40 x 100 feet on bedrock, produced about \$100,000.

The "Fannie" was among the first gold quartz locations on Pony Gulch and was bonded to Charles Sweeney in 1884, for \$5,000. One day's work paid for the bond, \$17,000 being produced in the short distance of 10 feet.

The "Fay Templeton" quartz claim, which produced \$100 per ton free gold for 40 feet of tunnel, was located by A. B. Ward in 1884. The first mill for grinding was an Arastra which was later replaced by two 5-ton Huntington mills which took out about \$300,000 from 1888 to 1893, inclusive.

Oscar Wallace worked his way up the old Mullan Trail in 1883 and built a cabin or two below what is now known as Wallace. He also built the first cabin on the site of the present city of Wallace, named in his honor. He located Canyon Creek as placer ground but failed to find little, if any, gold.

Mr. Wallace also located the first quartz claim, called "Oronogo," at what is now Burke, and at the present time owned by the Hecla Mining Company. A little later he built a pack trail which was later constructed into a wagon road

by S. S. Glidden which was used for the narrow gauge railroad built in 1887 and 1888. In the spring of 1884 prospectors came over the divide to Canyon Creek from the gold diggings, locating "Tiger," also "Poorman Mines," and several others, and they proved to be lead mines instead of gold mines. The 'Tiger" was bonded soon after to John M. Burke, for whom the town of Burke was named. Burke sold his property in about 1885 to S. S. Glidden, who built the first mill or concentrator on Canyon Creek.

Patsy Clark, of Butte, Mont., bought the "Poorman" from locators and later built the largest mill in the district at that time on this property. These two properties were consolidated in the early nineties with Glidden and associates in control; they later seiling to Charles Sweeney

and the Federal Mining Company. The Hecla Mining Company bought this property within the past few months.

The Standard Mine was located in 1885 by Tim McCarty, Jim Welch, and others and was bonded to Finch & Campbell and E. S. Kenney and others in 1889. They built a large and up-to-date mill at the mouth of Canyon Creek in 1890.

The "Mammouth Mine," located by Leonard Brothers, Dick Wilson and others in April, 1886, was worked for several years by original owners. In 1903 this property, with the Standard Mine, was sold to the Federal Mining Company which worked these properties for many years. At the present time it is being worked by leasers, some of whom have made small fortunes.

Governor Hauser, A. M. Essler and associates, all of Montana, bought the Helena Frisco Mine in 1887 and soon after built an up-to-date mill on the ground.

The original "Hecla" ground was

In the Sierra Nevadas

owned by Clark, Haley and Hardesty and was incorporated by Finch & Campbell in 1891. They later bought the adjoining group of claims owned by John H. Van Dorn. This incorporation was the basis of the Hecla Mining Company, now one of the regular dividend payers of the district and is at the present time under the able management of James F. McCarthy.

The "Hercules" was located by Harry L. Day and F. H. Harper in August, 1889, at the head of Gorge Gulch, and Harper sold out soon after. When ore was discovered in this property it was the sensation of the day, as there was uncovered the richest lead-silver deposits of the district, and its productions provided substantial fortunes for all intervided the statement of the district, and its productions provided substantial fortunes for all inter-

ested. The Hercules represents one of the few instances in which the original locators have continued to remain in control and have derived large fortunes.

The above were a few of the prominent lead-silver mines of the early days of

Canyon Creek which made stockholders and operators richer by many millions of dollars.

Oscar Wallace operated the Black Cloud on Nine Mile Creek in 1885 or 1886.

In 1885 or 1886 George B. Mc-Cauley and Van B. DeLashmet located the Old Granite Mine on the East Fork of the Nine Mile Creek and operated it for several years. It is still operated under the name of the Success Mining Company.

The Callahan Group was located by Callahan Brothers in 1885, at the head of the East Fork of Nine Mile Creek in Beaver and Placer Center Mining District, but was not brought to the producing stage until 1904 or 1905.

The Interstate Group, adjoining the Callahan Group, was located about the same time and was

managed by Oscar Wallace for several years. The Callahan Mining Company and the Interstate Mining Company joined forces and were incorporated under the laws of the State of Arizona, June 12, 1912, as The Consolidated Interstate Callahan Mining Company. This property was the first and richest zinc mine operated in the Coeur d'Alene Mining District. This company owns seventy-nine patented and unpatented claims which enriched stockholders over three and one-quarter million dollars in one year.

Going east from Wallace, county seat of Shoshone County, up the South Fork of the Coeur d'Alene River and along the Mullan Trail, we find the town of Mullan; early known as "Nigger Prairie" and later named for the pathfinder and explorer, Captain Mullan. Two of the early day mines at Mullan that are still working and paying substantial dividends are the "Morning," owned by the Federal Mining & Smelting Company, and the "Gold Hunter," owned by the Gold Hunter Mining & Smelting Company. There are also many other prominent prospects in this district worthy of notice.

Westward from Wallace, in the Osborne District, are several prospects, both north and south, that have every indication of becoming producing mines with development. A little farther west is Big Creek, a tributary to the South Fork of the Coeur d'Alene River, on which there are two or three early producing properties; the most prominent of which is the "Yankee Boy," now the Sunshine Mining Company. This property was located in September, 1884, by Blake Brothers, who worked it alone for years and made quite a large fortune. This is known as the silver or dry ore belt and runs for several miles east from Big Creek.

Moon Creek has some very promising prospects on the north side which, if worked to advantage, should be shippers in a short time. Farther west at Kellogg is the famous Bunker Hill & Sullivan Mining & Concentrating Company which is well known throughout the mining world. Farther on in this article we read the early history of the Bunker Hill & Sullivan Mine as related by "Dutch" Jake.

South of this wonderful mine, in the Pine Creek District, there are some wonderful embryo mines that should bring that district to the notice of the mining public in a short time.

From the first discovery of gold to the present time there has been no more attractive mining district in the world, both for stability and protection to the outside investor, than has been the Coeur d'Alenes. The way new producers are being opened up discloses that there is still an attractive field for the investing public. Millions have been taken from these eternal hills and hundreds of millions more still lie hidden for future generations to bring to the light of day. Such is the wonderful Coeur d'Alenes.

An interesting account of the discovery of one of the famous Coeur d'Alene properties is told by "Dutch Jake." We present it herewith as a part of the history of this district.

History of the Discovery of the Bunker Hill and Sullivan Mine

By "DUTCH JAKE"

"I'm going to tell the true story about the discovery of the Bunker Hill and Sullivan mine in the Coeur d'Alenes, Idaho. There have been a lot of stories written about it, but I never saw one that was right all the way through.

"It happened back in 1885. I was then at Murray, in the gold belt of the Coeur d'Alenes, where my partner, Harry Baer, and I had a saloon. We were partners, too, in mining deals. Harry stayed to tend to the business in Murray while I went out into the hills looking after prospects. Dutch Jake's bar, on Myrtle Creek, near Murray, is named after me.

"I was pretty close to 30 years old then and I had made \$25,000 or \$30,000 in tie and pile contracts for the Northern Pacific during construction days. I had owned some saloons along the railway and we did a little gambling. In 1883 I went into the gold belt of the Coeur d'Alenes on snowshoes, over the mountains from Trout Creek, Mont. There was 20 feet of snow on the hills. I was a 'real thing' as a pioneer, as I helped to lay out the towns of Murray, Mullan, Eagle, Burke, Delta, Littlefield, Kellogg and Wardner.

"I got acquainted with Phil O'Rourke, an old Colorado miner, who was considered the best prospector in the camp in those days. In the early summer of 1885 we went over toward Mullan to look after some claims. When we returned to Murray with our cayuses we found old man Kellogg. He had been out prospecting on the South Fork of the Coeur d'Alene river, near the spot where Kellogg, Idaho, now stands, and he brought back some iron capping that he found. The old man was prospecting on a grubstake for Messrs. Cooper and Peck of Murray, Idaho. They had provided him with a burro and with \$18.75 worth of tools and provisions. With



"Jack," the Original Discoverer of the Wealth of the Coeur d'Alenes

that he had put in about two months in the hills, and all he had to show for it was this iron cap. He showed it to Cooper & Peck, and they asked John M. Burke about it. Burke had a great reputation. He saw it was a smelting ore, and when he told Cooper & Peck so they got disgusted, for they wanted free gold. They told Kellogg that he had better quit prospecting if he couldn't get free gold.

"Kellogg showed his samples to Phil O'Rourke. It didn't take a minute for Phil to see that it gave promise of producing some galena or carbonates, like the ores that made Colorado famous. Phil came to me and told me we had better join Kellogg in staking that ground. So I turned our cayuses and provisions over to Phil and Kellogg, and they struck right off for the South Fork. Meantime Kellogg had notified Cooper & Peck that he had quit the grubstake deal with them.

"Kellogg took O'Rourke down to Big Creek, on the South Fork, and pointed out the big iron capping that covered the ledges. Moving down the river, they came to Milo Creek, where the town of Kellogg now stands. There they lost a pack horse, and while old man Kellogg went in search of it, up Elk gulch, Phil started the hunt up Milo gulch. At the head of the creek he found some galena float. Though it was dreadful hard work to get through the brush and fallen timber, he climbed up the hill about 500 feet, and there he stumbled upon the great Bunker Hill ledge, sticking right up out of the ground. There was nothing in sight but glittering galena, and O'Rourke knew he had found the greatest thing ever discovered in the northwest. He was so excited that he sat down half an hour before he knew what to do. Finally he rushed back and told Kellogg, who was in camp at the mouth of the gulch. After supper they spent the time planning how to locate their find. Phil was so excited that he had forgotten to put up any posts. That night he wrote out the location notice, and called the mine the Bunker Hill, after the battle of the Revolution. But he decided it would be best to have Kellogg sign the notice as locator.

"Next morning they went up the gulch, about two miles, to make the location; but their cayuses had strayed away. As luck would have it, they found the old white burro that Cooper & Peck had turned over to Kellogg as a part of his grubstake. The burro had wandered away when Kellogg was there the first time. They caught the beast and loading their picks and grub on it, they went up the gulch to the Bunker Hill lode. Then Kellogg happened to think that maybe he'd better not appear as locator, for Cooper & Peck might claim an in-

terest on account of his first grubstake. So they threw away the location notice containing Kellogg's name as locator and wrote a new one, with O'Rourke as locator and Kellogg as witness.

"They went back to Murray next morning and the sight of their samples set the camp crazy. Everybody knew in a general way that the find was on the South Fork, and although O'Rourke and Kellogg wouldn't tell folks exactly where it was the miners were getting ready for a stampede.

"Phil took me off to one side and wanted me to locate the extension of the Bunker Hill. He thought that I had better take Con Sullivan along with me. Sullivan was a sort of side partner of Phil's. That night at 10 o'clock Con and I started out in a furious rain without even a pack horse. We thought we could locate the mine by the direction that Phil O'Rourke gave us. But as it turned out he had made a mistake in describing the location, and we took the wrong hog back. We had a dreadful We went up a hog back near Resolution Gulch, and for three or four days wandered on until we went away past Kellogg peak, clean over into the St. Joe river country. We were completely lost and had nothing to eat and nothing to drink for a couple of days except some snow that had lain in gullies since the last winter. Sullivan was pretty nearly done for. His tongue was sticking out and he could hardly move. You see, we had been walking all the time, day and night, except for the little rests when we had sat down to get our bearings. We wandered around almost in a circle on those mountains, and at last came out on the South Fork of the Coeur d'Alene, a little above Kingstonabout a mile. My, but I thought we would drink the river dry.

"A halfbreed woman on a ranch there gave us something to eat, and we went on up to Jackass prairie, near the mouth of Milo Creek. By that time we knew where we were, and Sullivan went up the gulch to the mines the next day and I went on to Murray. I was sore all the way through at O'Rourke. I thought he had lied to me about the route to the mines. But when I reached Murray I got word to come back to the strike, so back I went and found out that Phil had made a mistake.

"Meanwhile Cooper & Peck had been there looking at the strike. They found the first location notice that Kellogg had thrown aside, and they learned through the talk of Kellogg and O'Rourke that the two had used Cooper & Peck's burro in making the location. That was enough for Cooper & Peck. They commenced suit against the locators for a half interest in the property on account of their original grubstake. They didn't think of locating the extensions to the

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Bunker Hill, for O'Rourke had put up some fictitious posts to cover the ground. So when I got back there Sullivan and I located an extension, and we called it the Sullivan mine, in honor of John L. Sullivan, the pugilist. It was staked September 10, 1885, just ten days after the Bunker Hill was staked.

"When Cooper & Peck's suit for a grubstake was brought in the district court at Murray the jury gave a verdict against them. However, Judge Norman Buck, who presided, reversed the jury's verdict and held that the real discoverers of the Bunker Hill were Phil O'Rourke, Kellogg and the jackass, which was the property of Cooper & Peck. He gave Cooper & Peck a quarter interest in the Sullivan and a half interest in the Bunker Hill. It was shown in the trial that Messrs. Cooper & Peck only went good for a grubstake to Kellogg, amounting to \$22.85. They had paid \$2.40 of it and the balance is unpaid to this day. The late W. B. Heyburn, senator from Idaho, and Major Woods, of Wallace, Idaho, were counsel for Cooper & Peck. Our attorneys were Albert Allen, Judge Clagett and Frank Ganahl. The lawyers all got interests in the mine for their fees. We appealed the case to the Supreme Court of the State, but while it was pending there a deal was made to sell the mine to Sim Reed of Portland, Oregon, for \$1,500,000. It was necessary to give him a clear title, so we compromised by paying Cooper & Peck \$76,000.

"The sale was made in May, of 1887, and it was put through by Colonel 'Jim' Wardner. Harry Baer and I, who were partners in all our mining operations, got \$200,000 cash in one lump for our interests. Phil O'Rourke got over \$200,000, Kellogg got \$300,000, Con Sullivan got \$75,000, and Alex Monk, a sort of side partner of O'Rourke's, got \$75,000. He is a lucky fellow. He put \$25,000 in Chicago street-car stocks and trebled his money in three months. He is living in Ireland now, although he still has some interests here and was back at Wardner a short time ago. Old man Kellogg died a couple of years ago. He had lost his money. Con Sullivan also went to Alaska, and was murdered in Alaska on Yiounmack Island in 1901. with his brother, Clarence Sullivan, and Ed Rooney. One of the company by the name of Owen Jackson is the only one that got away out of the four. He escaped and later identified the murderers, who were hung for the crime."

MANGANESE ORE IN 1923

MORE manganese ore was shipped in the United States in 1923 than in 1922, according to final figures given out by the Geological Survey. The shipments increase more than two and one-

third times—from 13,404 gross tons in 1922 to 31,500 gross tons in 1923.

The average value per ton of the ore imported from Germany in 1922 (\$90.22) and from Germany and England in 1923 (\$100.37 and \$126.74, respectively) are near the prices received for ferromanganese and are considerably above those received for manganese ore. It is therefore probable that the imports from those two countries reported as manganese ore represent, in part at least, some other material. The average value of all reported imports of manganese ore in 1923 was \$18.80 a ton.

The imports in 1923 were the smallest since 1911 and were less than half those in 1918, when the domestic production was nearly ten times as great as in 1923. Consequently domestic production plus imports in 1923 (238,000 gross tons) was less than one-third of production plus imports in 1918 (797,000 gross tons). These figures, however, do not indicate a decrease in the requirements for manganese in 1923. Most of the manganese ore consumed in the United States is employed in making ferromanganese and spiegeleisen, which are used in the manufacture of steel, and the steel produced in 1923 amounted to 44,943,696 gross tons as against 44,462,432 gross tons in 1918, and, except the production in 1917 (45,060,607 gross tons) was the highest ever recorded. Large stocks of manganese ore were accumulated in the United States prior to September 22, 1922, when the tariff on manganese went into effect, and the large imports of ferromanganese in 1922 and 1923 made possible the great production of steel stated with so low a total domestic production plus imports of manganese in

As usual, Montana produced by far the largest quantity of ore containing 35 percent or more of manganese—21,916 gross tons, more than twice the production of all the other states together. Arkansas came second, with 3,768 tons. Colorado and Georgia shipped some ore in 1923 after having been completely unproductive in 1922.

The shipments of ore containing 10 to 35 percent of manganese decreased from 344,674 tons in 1922 to 319,666 tons in 1923 owing to a decrease in production in Minnesota and New Mexico, as the other states that produced ore of this grade in 1922 (principally Georgia and Michigan) increased their shipments, and several states, notably Arkansas and Colorado, began shipping.

The shipments of ore containing 5 to 10 percent of manganese increased from 251,614 gross tons in 1922 to 1,072,457 tons in 1923. The chief reasons for this immense increase are the facts that the shipments from Minnesota rose from 248,560 tons to 499,181 tons.



THE WORLD'S GREATEST ZINC-MINING FIELD

History of Development Tri-State District—Nature of Ores—Early History of District—Development Picher-Miami Field—Operating Conditions—Future Possibilities

By JULIAN D. CONOVER *

VER sixty percent of the zinc produced in the United States and fifteen per cent of the lead come from a small area overlapping the adjacent corners of Oklahoma, Kansas and Missouri, known as the Tri-State district. Nine-tenths of this production is from a portion of the mining field about eight miles long and five miles wide which centers in the town of Picher, Oklahoma.

The preeminence of this small section in the zinc mining industry dates back only to the time of the World War, when phenomenally high prices for zinc resulted in an era of intensive prospecting and development of the rich ore bodies which had been discovered in the Picher-Miami field shortly prior thereto. The general region; however, including the many hundreds of formerly producing properties in the vicinity of Joplin, Webb City and Carterville, Missouri, Galena, Kansas, and numerous smaller mining centers, has for fifty years been the the foremost zinc producing district of the United States.

In 1923 the production of recoverable zinc from the Tri-State district totaled 378,000 tons, with a value of \$50,250,000. This quantity was equivalent to practically three-fourths of the total primary output of zinc in slab or metallic form (as distinguished from the minor amount of zinc in pigments and chemicals) in this country. The zinc output of the district has for a number of years been about 35 percent of the total production of the world. The concentrates produced are of high grade, assaying from 58 to 64 per cent of the metal, and are especially desirable for the common retort type zinc smelter. The lead production of the district is also important, being exceeded in this country only by that of the Southeast Missouri district, the Coeur d'Alene district of Idaho, and the state of Utah.

The ores of the Tri-State field are of the well-known Mississippi Valley type, occurring in flat-lying sedimentary beds consisting mainly of limestones and chert. They contain the sulphides of lead and zinc, galena and sphalerite (locally known as "jack"), usually intimately intermixed in varying proportions, with a tendency for the lead to be more prominent in certain deposits near the surface and in the upper portions of ore-bodies, with larger quantities of zinc at greater depths. The country rock in which these materials occur consists mainly of a very compact, hard chert or fiint. Near the surface the oxidized ores, lead carbonate or cerussite (locally known as "dry-bone") and the zinc silicate, calamine, with a little of the carbonate, smithsonite, were found in many places in the older camps, and considerable quantities of these minerals were mined in the early days.

The ore-bodies occur at shallow depths. having been found at various depths all the way from the grass roots to about 400 feet. They are of very diverse form and size, and in many places are related to an old erosion surface of the limestones which was covered with later sand and shale formations. They occur in "runs" and irregular masses, associated with solution channels and sinkholes and other features of the old land surface. In these deposits the ground is frequently rather broken and open. They are characteristically irregular in form and discontinuous, and no criteria have been found which will lead with certainty to their discovery. Closely associated with them in certain parts of the district are the "sheet ground" orebodies, which were extensively mined in the vicinity of Webb City and Carterville. These are lower grade, blanketlike deposits, occupying certain mineralized portions of a persistent chert bed which underlies the other deposits in this region.

EARLY HISTORY OF THE DISTRICT

Mining did not begin in the Tri-State district until about 1850, though the existence of lead ores had been known at a considerably earlier date to the Osage Indians and to the hunters, who used the ore as a source of metal for bullets. Discoveries of shallow "runs" and pockets of lead ore were made in the area north of Joplin and at Granby, Missouri, at about this time. A number of lead furnaces were put up, and in a few years the production exceeded 4,000 tons of lead per year. During the Civil War the mines were worked alternately on Federal and Confederate account, and were the cause of much of the fighting in southwestern Missouri. The Granby mines were for a good many years the chief producers, but beginning in 1870 numerous discoveries were made in Joplin and the adjacent country, miners flocked in from all directions, development spread in a series of waves to various parts of the field, and the population and activity of the district grew with the rapidity characteristic of mining

For some time the lack of transportation and smelting facilities resulted in the throwing aside as waste of the zinc ores of the district, the presence of which had been recognized almost from the beginning. In 1872, however, a shipment of zinc concentrates was made to a smelter in Illinois; and in the next few years the building of zinc smelters at Weir and at Pittsburg, Kansas, together with the completion of railroads to Joplin, providing adequate market facilities, gave to mining operations an additional impetus, and caused the district to assume the leading position in the zinc industry which it has held ever since.

The early methods of mining were of

^{*} Secretary, Tri-State Zinc and Lead Ore Producers Association.



Panorama from Picher, Oklahoma, Show ng Kansas, Oklahoma, Mining Field

the crudest sort. Operations were conducted largely by lessee miners on parcels of land a hundred or two hundred feet square, using rudely timbered shafts less than a hundred feet deep, and hoisting the ore, as well as any water encountered, in buckets by means of a windlass or horse-whim. The same methods survive to some extent today, being utilized by "gougers" in various parts of the field. Milling or ore-dressing methods were equally primitive, the ore being sorted and crushed and then washed with hand-jigs, which were not infrequently perched on top of the tailingmounds. One writer * says that from a distance the mines, "with their swarms of busy men and heaps of tailings piled around the shafts, remind one strongly of gigantic ant hills, and present a sight not soon to be forgotten." The inefficiencies of the system were glaring, and yet it developed naturally from the . irregular, uncertain conditions of ore occurrence; and it was not without its advantages in building up an enterprising, hard-working, capable body of prospectors and miners-who made fortunes in mines and invested their capital and their energies in the discovery and development of other mines, who were both workers and mine-owners, with a common tradition of independence and

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opportunity which has been a source of pride to the district.

"SHEET GROUND" MINING

As mining progressed, larger scale and improved methods were gradually introduced. Mechanical hoists and pumps, together with the development of the 'Joplin type" of mill, permitted the mines to operate to greater depths and to utilize ores of lower grade. Up to the early nineties the ore mined was very rich, many of the mines yielding a ton of concentrates assaying 60 per cent zinc from between two and five tons of the crude ore or "dirt," while few mines could be profitably worked which did not yield 10 per cent of mineral. By about 1900, as a result of improved operations and with the aid of high prices for zinc ore, the average yield of the district was not over 5 per cent, and many mines with a recovery of only 4 per cent were worked. Shortly thereafter the working out of many of the old "runs" and lens- or pod-shaped ore-bodies of the "soft ground" type caused recourse to be had more and more to the lower-grade blanket or "sheet ground" deposits which were known to be present in large quantities. The principal sheet-ground operations extended over an area some ten miles in length and a mile or so in width running north and south through Webb City and Carterville, Missouri. Larger-

scale methods, improved mining and milling practice, the introduction in places of regrinding machinery and sludge tables to recover some of the fine ore particles formerly allowed to go to waste, and more systematic cost-accounting methods combined to permit mining of rock from which the average recovery in the form of concentrates was only 2½ per cent and in many cases was less than 2 per cent.

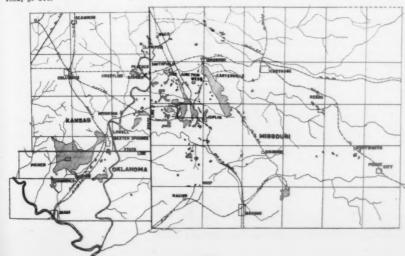
The era of sheet-ground mining lasted till about 1916. In the last year or so of this period nearly half the production of the Tri-State field came from the mines in this area.

DEVELOPMENT OF PICHER-MIAMI FIELD

During this time a certain amount of development had been going on in the southwestern part of the district, where, beneath the level prairies of Oklahoma, rich "runs" of ore had been discovered and worked near the town of Commerce. By 1914 prospecting by drilling had been carried northward, demonstrating a wide extension of the ore-bearing territory in what is now the Picher-Miami fie.d.

The World War brought about in this area the most spectacular development the Tri-State district had ever seen. The capture of the Belgian zinc smelters by the Germans in the summer of 1914, at a time when consumption of zinc in the manufacture of munitions was rapidly mounting, was followed by competitive buying of zinc in the United States which resulted in the "skyrocketing" of the Joplin base price of concentrates from \$45 per ton in January to \$104 per ton at the end of July, 1915, and as high as \$135 per ton in the early part of 1916. The impetus of these prices brought on an amazingly rapid development, which had all the familiar characteristics of the boom period of a bonanza camp of the West. Drilling operations were carried on to an extent and with an intensity never before witnessed. With over a thousand rigs at work, the early discoveries were rapidly multiplied and many ore bodies of high grade proved up, shafts were sunk and mills rapidly constructed, until in the middle of 1919 about 200 mills and several towns existed where three and a half years before

*F. L. LeClerc, Mineral Resources of the U. S., 1882, p. 370.



there had been nothing but open prairies and waving grass. The investment in mining and milling equipment and exploratory drilling and development during this period has been estimated to have been over \$25,000,000, in addition to the large amounts invested in lands and leases.

The production of the new field was practically doubled in each year from 1916 to 1918, and it became the dominant factor in the district. The sheet-ground and other older mines were practically abandoned for the richer deposits of the Picher camp. This was especially true as the war boom began to subside, and rising costs of materials and labor with descending prices for ore wiped out the margin of profit for all but the highrecovery mines. Many of the mills were dismantled and sold or moved to the Miami district, and in a few years scarcely a wheel was turning in many of the camps which had for so long hummed with activity.

In the newly developed field itself, a period of liquidation and deflation was the necessary sequel to the war boom. Intensified activity and overdevelopment, undertaken in part under the intoxication of soaring prices of zinc, resulted in a capacity for production which was far in excess of the normal demands on the district. Production once started went on in large part of its own momentum, even when the mines were barely breaking even or in some cases actually losing money; and with the cessation of the abnormal war demands there was an accumulation of stocks of zinc metal and ore as a result of which prices slumped abruptly. In 1921 they declined to below \$20 for 60 per cent zinc concentrates, the lowest figure in twenty years. Most of the mines were forced to shut down, and exploration ceased entirely. The bottom of the depression, however, was reached in that year and there has subsequently been much improvement. Most of the mines have renewed operations, for at least parts of the year when prices have justified it, various new mills have been built and there has been a steady increase in drilling operations and in the search for new ore-bearing territory. In 1923 the shipments from the district were the largest, both in tonnage and in

value, in any year of its history. The demands for the zinc and lead ores of the district have increased, and the situation from a country-wide as well as from a world standpoint has seemed to indicate that these demands will still further increase in the future.

Under conditions existing today, the Tri-State district still has a considerable overproductive capacity. The custom has for some time been to operate the mills on the basis of a single shift of ten hours per day six days in the week. In many cases it is not possible to supply them with enough crude ore or "dirt" to run on a double-shift basis. There are at the present time 135 mills operating in the district, but some of these are near the end of their operating life while there are others which are being put in shape for production. The mill is the operating unit, which may receive its ore from a number of "mines" or shafts; but because of the prevailing system of leases, the ordinary mill draws its ore only from the one forty-acre tract on which it is located except where there happen to be two or more such tracts under one operating lease. This fact, together with the nature of the ore-bodies, which are very irregular in form and cannot economically be blocked out in large tonnages in advance of mining, results in the building of small plants. usually of 250 or 300 tons capacity per day. The average "recovery" of the mills at the present time, in zinc and lead concentrates, is close to 7 per cent of the tonnage of rock milled, with about one ton of lead concentrates to six of zinc. The milling equipment and practice, as well as the system of mining and of hoisting in "cans" or tubs, is practically standard throughout the district, and while improvements are made from time to time, it is on the whole well adapted to the type of operations and the short life of the individual mines.

The Tri-State field has sometimes been spoken of as the last stand of the small miner. A majority of the mines are owned by companies of small capitalization, as compared to the great companies which conduct most of the present-day operations of western mining camps. There are a large number of companies owning only one or two mines, and conducting operations with relatively little working capital. The field is one where the miner of today has been the mineowner and operator of tomorrow. The importance of the district as the main source of high-grade zinc ore for slab zinc manufacture, however, has attracted to it a number of the large zinc-smelting companies, who have bought and are

operating a considerable number of properties which were either producing or which they have developed to the producing stage. Such companies now control a considerable portion of the production of the field, but the greater amount of it is still in the hands of the local, independent companies.

One might judge that mining operations in the Tri-State district were of a highly temporary nature, without such an element of permanence as attaches to many of the larger operations of the West. To a certain extent this is true; and yet the short life of the average mine is a feature which is recognized and taken into consideration by many of the operating companies, who are constantly searching for and acquiring new mines to take the place of the ones which they are working when these become exhausted—thus affording themselves a continuous life and steady operations.

The methods of doing business in the Tri-State district are unique. The ores are sold weekly to agents of the various smelting concerns, frequently by telephone, and transactions amounting to hundreds of thousands of dollars are conducted each week without a written contract of any kind. The labor of the field is practically 100 per cent white and native born, wages are based on the prevailing ore market, and there has never been any serious labor disturbance. Housing and sanitary conditions leave a considerable amount to be desired, but this has been due to the extremely short tenure of the surface leases on the rstricted Indian lands of Oklahoma, as well as to the rapid development of the present mining field, and various influences are at work to ameliorate conditions.

FUTURE POSSIBILITIES

In the extraordinary and unparalleled development of the Picher field, which in a few years discovered and brought to the producing stage mines the development of which would ordinarily have been spread over a much longer period, the approximate limits of the main mineralized area in this section were apparently determined. Within this area several hundred ore-bodies have probably been located and many of them mined

out, but their occurrence is so irregular and there is so much of the area which has not been drilled that there are doubtless large quantities of ore still to be discovered. The limits of the field have been extended from time to time in certain directions by new discoveries, and there has also been great activity in the adjacent country outside of the



A Typical Concentrating Plant, the Tri-State District

present productive area, where drilling produced favorable results. Throughout the whole Tri-State district, as shown on the map, there are many large areas which are practically untouched from a prospecting standpoint, and it would not be surprising to see a large number of new producing properties developed some day. The confidence of certain large interests which are spending great sums of money in exploratory work speaks well for the future of the district.

One development of the future which is anticipated by many of the older operators is a return to some of the lowergrade mines of the sheet ground which were abandoned in the latter part of the war period. Increasing world demands for zinc from this district, coupled with the gradual decrease in productive capacity of the Picher field as some of the mines become worked out, may well bring about higher prices and make profitable the reopening of these mines. Such developments, of course, will still further stimulate the exploration for new mines all over the field; and there can be little doubt that for many years the Tri-State district will be the scene of profitable mining activity, and will produce its share of the zinc and lead of the world.

DANGER HAZARD OF OPEN-TYPE ELECTRICAL EQUIPMENT

An Analysis By Bureau Of Mines Of Accidents Due To Exposed Electrical Equipment

THE use of open-type electrical equipment, which fails to safeguard against the transmission of sparks and flame to gaseous and dusty atmospheres in coal mines, constitutes a real menace to the American miner, according to the Department of the Interior. Records of the Bureau of Mines covering twenty-six coal mine disasters and fires due to unsafe electrical apparatus show the loss of 500 human lives in addition to great damage to property. An open-type electric coal drill used in a gaseous mine in West Virginia was the probable cause of the death of twenty-seven miners. A half-safe type of electric coal cutting machine used in a gaseous mine in Pennsylvania was probably the cause of the death of thirty-six men. An unapproved, unsafe type of flame safety lamp used in a gaseous and dusty mine in Utah was the alleged cause of the death of 171 men. All three disasters happened within the past six months and would seem to have been avoidable if proper equipment had been used.

Electric current can cause accidents in coal mines in five general ways: By shock to persons; by igniting powder; by igniting gas; by igniting coal dust; and by setting fire to inflammable material, such as timber and coal. A great

many accidents from these causes are preventable if proper care is taken. Most of the accidents caused by sparks and flashes from electrical apparatus would not take place if electrical equipment tested and formally approved by the Bureau of Mines was used. So far as known, up to the present time no disasters have been caused by sparks or flashes from equipment having the bureau's approval.

During the past fourteen years the Bureau of Mines has, in cooperation with manufacturers of electrical machinery and equipment for mines, conducted thousands of tests on various machines and apparatus submitted by the manufacturers to determine whether the device is safe for use in explosive mine atmospheres. If the machine, or any part of it, is not safe, the bureau and the manufacturer work together to eliminate the unsafe features. When the machine finally passes the bureau's tests, it is formally approved for use in coal mines where hazards from gas and dust occur. Several classes of equipment have been tested, and there is a steadily growing list of approved equipment recommended for use whereever such equipment is needed.

Following recent disastrous coal mine explosions in different states, it is understood that more rigid requirements relative to electrical installations in mines will be enforced in West Virginia. A committee of state mine inspectors has made definite recommendation of similar nature for improving the conditions in the Pennsylvania mine in which the explosion referred to occurred. The Industrial Commission of Utah has already issued new orders which will remedy the use of unsafe mine lamps in that state.



Placer Mining in California

MINE SAFETY BOARD

A NEWLY constituted Mine Safety Board has been organized by the Interior Department, Bureau of Mines, with George S. Rice, chief mining engineer, acting as chairman, and Matthew Van Siclen, engineer in charge of the division on mining research, acting as secretary. Other members of the board are T. T. Read, safety service director; O. F. Hood, chief of the fuels and mechanical equipment division, and Dr. R. R. Sayers, chief surgeon.

The new Mine Safety Board, with headquarters in Washington, supersedes the old mine safety committee at the Bureau's Pittsburgh experiment station, and has broader functions and responsibilities. It considers all questions arising within the Bureau's work as to practice, devices, or methods for increasing safety in mines and quarries and formulates decisions as to the best policy for the Bureau to pursue to attain that object. One of its chief objects is to bring into practice in the mines the lessons in safety that are developed by the Bureau's researchers.

As a result of recent meetings of the Mine Safety Board, circular letters seting forth the position of the Bureau of Mines regarding the use of black powder in coal mines and on the use of open lamps in non-gaseous coal mines have been prepared and forwarded to Bureau engineers for consideration. Other subjects being considered by the Mine Safety Board are electric shot firing from the surface; cushioned method of blasting coal; magnetically locked safety lamps, and requirements for igniter on permissible flame safety lamps.

MINING BY AIRPLANE

M INING by airplane may soon be in vogue in Alaska. Experimental service has proven so popular with miners that it may be extended by the Post Office Department over new routes and to include the transportation of miners, prospectors and mine products. Carl B. Eielson, air-mail pilot, conferred with postal officials today on extension of the service, which, he reports, has been

enthusiastically received by miners. He recently carried gold for some mining engineers and also transported a prospector from Fairbanks to Mt. McKinley, the latter at a charge of \$200, which was much cheaper and quicker than any other means. One airplane route has been adopted from Fairbanks to McGrath and others are proposed to Koyukuk and Nome. Gold mining men are preparing to ship their gold out by air mail, said Mr. Eielson, who is hopeful of securing extension of the service in the interest of the mining industry.

ECONOMIC SURVEY OF UNDEVELOPED SOUTHERN MINERAL RESOURCES

Undeveloped Mineral Deposits Studied—Transportation And Market Facilities Investigated—Ultimate Creation Of Interconnected Super-Power Zones Favored—Taxation And Labor Problems Reviewed—Opportunities For Immediate Development Of Many New Industries And Fields For Prospecting Indicated

HE first week in February of this year the field work for an economic survey of the undeveloped mineral resources of the South was begun in Kentucky, and extended thereafter to Tennessee, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Texas,

Virginia and West Virginia, in the order named.

This work was based primarily on the records, files and publications of, as well as personal interviews with, the state geologists of the various states. To this foundation have been added similar data from the industrial agents and chief engineers of the various railroads traversing these states. Interviews have been held with the executives of many large corporations, and the general work of the Chambers of Commerce and Boards of Trade has

been thoroughly studied and digested.

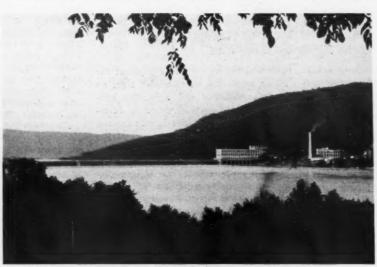
Every effort was made to avoid anything savoring of promotion, stock selling, or out of the realm of the legitimate development of logical, potential mineral resources. In addition to this a considerable amount of field work and personal examination took place, and a number of valuable geological correlations have resulted from the joining of the various local data so obtained.

During the same period a considerable number of public addresses were made in the various states under the auspices of Chambers of Commerce, Civic Clubs and State Universities. In addition to outlining the undeveloped resources of the localities where such addresses were made, an effort was put forth throughout the South to infuse the people with a keener sense of the advisability of developing these latent industries and utilizing their markets and manufacturing possibilities.

The various phases of taxation were

By Dr. HENRY MACE PAYNE

discussed and the value of increased home industry in lowering individual taxation was made plain. The people throughout the South were familiarized with the effects of the orgy of borrowing



The Tennessee Electric Power Company's Plant at Hale's Bar, on the Tennessee River

and spending the proceeds of tax-exempt bonds with which, in recent years, the country has been afflicted; it was pointed out that whenever any material sum is taken from the available sources of investment capital and placed in a taxexempt bond issue, legitimate industry is deprived of an equal amount of capital with which to carry on normal expansion.

The wide diversity in methods of assessment throughout the South has led to a multiplicity of state tax laws, in many cases not only burdensome to industry but widely divergent in results.

The tendency toward the creation of commissions has added to wasteful expenditure and inefficiency and has provided additional tax-spending agencies whose maintenance has been borne in large part by the basic industries—agriculture and mining.

Another national problem which received consideration was that of railroad rates and transportation as applied to the industrial development of the com-

munity and of the country at large. The American Mining Congress, while advocating lower freight rates on certain basic raw materials shipped in carloads and frequently in train load lots, nevertheless believes that the railroads should be left alone under the Transportation Act, at least until such time in the

future as careful study may indicate intelligent changes.

Of supreme importance to all industrial development throughout the South is the necessity for systematic and economic development of power, whether steam or hydroelectric, with a view to the ultimate creation of interconnected super - power zones over the whole country.

Only in this way can the economic utilization of the cheap fue's of Texas be coordinated with the proper distribution of the great waterpower heritages of other states; only by

cooperatively developing these units can states like Mississippi and Louisiana receive their share of the surplus power latent in the great rivers of the Carolinas, Tennessee and Arkansas.

Many people of the South have failed to appreciate the magnificent inheritance of Anglo-Saxon labor which is theirs. It is only when the alien population figures of New England and many other states are shown in comparison that a proper realization is had of the industrial advantages which now accrue south of the Ohio and Potomac rivers. New England is 60 percent alien population; North Carolina is seven-tenths of 1 percent; the entire South only 8 percent. With great power resources, therefore, and unequaled supplies of raw material, with transportation facilities far above the average, equitable climate, and superb labor conditions, all the elements of a great mineral empire lie awaiting recognition and development.

When cheap power meets cheap trans-

portation near the source of raw material, great manufacturing centers automatically spring into being. With added domestic and world markets, with decreased taxation because of increased industry, with contented workmen employed near their own homes, the development of these potentialities should mean within the next few years a southward movement of the industrial center of the United States.

Texas

With the great iron ore deposits found in seventeen of the counties of Northeast Texas, the molybdenum, the tin and copper and zinc of West Texas, and an unparalleled supply of coal, oil and gas in

that state, it does not require the dream of a promoter to see another Birmingham or Pittsburgh spring up within easy transportation distance of the great and growing parts of Houston, Galveston and Corpus Christi.

In addition to a well-defined area for the recovery of precious metals, the quicksilver deposits of southern Brewster County cover some six hundred square miles; the tin deposits in the Franklin Mountains, the sulphur and salt, the road-building materials, sand and gravel, granites and building stones and the great potash fields of Western Texas alike await prospecting and commercial develop-

ment. To these may be added mineral waters, asphalt, graphite in five of the central counties, mica in Culberson County, and gems and precious stones in Brewster and surrounding counties. The brick and tile and associated industries are already well established in the more thickly populated section of the state and, as industry and increased population demand, abundant supplies of suitable clays are available in unlimited quantities.

Arkansas

The manganese, zinc and lead ores of the White River Valley, the great quarries of building stone, adequate in extent to supply the demands of a half dozen states, the bauxite, diamonds, coal and oil of Arkansas are only the principal resources which to date have received attention.

The great manganese deposits especially have proven of even better grade and higher metallic content than was at first anticipated when they were opened up in response to the demands of war. The placing of a tariff on an economic basis rather than its continuation as a political football will place Arkansas in

the front rank of American manganese producers.

Richard H. Edmonds, in a recent issue of the Manufacturers' Record, says that "Arkansas has more resources in proportion to the knowledge the outside world has about them than any other state in the Union."

The recent improvement in transportation facilities and in the extension of good roads and an analytical study of taxation have given a new impetus to industrial development in Arkansas.

Louisiana

A few years ago a well-informed business man of Louisiana made the statement that, having no mineral resources,



Shovel Operating in Open-Cut at Montgo mery Mine (Manganese)

the state must depend wholly upon agriculture and lumber; yet today her salt and sulphur, her oil and gas have made her one of the great mineral-producing states. To these may be added incredibly large deposits, running into hundreds of millions of cubic yards of oyster shells, great fields of lignite coal and natural gas for fuel purposes, glass sand in Washington parish and an abundant supply of marl, suitable, in conjunction with the oyster shell beds, for the creation of cement and calcium arsenate industries.

Mississippi

Mississippi, also called an agricultural state, with vast resources of limestones and building stones, of sand and gravel, of tripolite and Fuller's earth, of bauxite and lignite, of mica and phosphate rock, has already awakened to the call of the mineral prospector, and a network of good roads is rapidly spreading through the state, simultaneously with a school system of exceptional merit.

The development of hydroelectric power on the great rivers lying north and east of Mississippi, if properly safe-

guarded and made available through interconnected super-power zones, will make possible in Mississippi the erection of electric smelters near the iron ore deposits of Benton and other north central counties; of aluminum reduction works in the bauxite deposits extending south from Tippah County, and will bring to Mississippi a wealth of capital and industrial enterprise which will make her one of the great mineral producing states of the South.

A wide diversity of clays, deposits of other and barytes and the development of the potential oil areas, similar in structure to those of Arkansas and Louisiana, will add abundantly to Mississippi's mineral wealth.

Tennessee

The zinc industry of Tennessee has grown remarkably within the past ten years; silver and gold, largely as by-products, add to the value of the production; iron ore with coking coal and limestone adjacent, and the manufacture of ferro-alloys, have served to join the great Birmingham district of the South with Chattanooga and Knoxville on the north and east. This district today is the center of the great cast-iron pipe industry of the United States, whose development was made possible solely

through the granting of low freight rates on basic raw materials by the railroads centering in the Birmingham district.

The phosphate rock deposits center around Mt. Pleasant, Columbia, Pulaski and Middle Tennessee. These deposits average 70 percent. Other deposits of enormous area run from 40 to 60 percent. These latter deposits will some day be commercial. It is a field for beneficiation.

With the development of hydroelectric power, the electric furnace process for making phosphoric acid at Anniston, Ala., and elsewhere is rapidly coming into favor.

The matrix of this lower grade phosphate is a sandy lime carrying approximately 20 percent silica. It is likely, therefore, that improved metallurgical processes will soon open up new plants in this industry. In addition to the brown phosphate indicated, the blue phosphate lying in the Gordonsburg district and the white phosphate in Decator and Perry counties, running 80 to 90 percent clear phosphate, will also assume commercial inportance.

Bauxite in Eastern Tennessee, copper in the Ducktown district, barytes in Monroe County and along the North Carolina and Tennessee line, silax at Cleveland, ochre at various points throughout Eastern Tennessee, and wellknown deposits of high-grade clays in both eastern and western parts of the state, are among the resources as yet but partially developed.

The Coker Creek district in Monroe County, like the Dahlonega district of Georgia, was at one time a substantial producer of gold. This valley has recently received renewed attention and will probably be further exploited.

Natural gas in Campbell and Anderson counties and oil in a number of localities throughout the state will apparently increase in production from year to year.

There are large areas of molding sand in Henderson County and many undeveloped deposits of marble and granite in Eastern Tennessee. Road-building materials, sand and clay, cement, limestones, shales and marls, slate deposits for the manufacture of artificial roofing and oil shale deposits of commercial grade in thirty out of ninety counties in the state add to the potential wealth of Tennessee.

Kentucky

In many ways developed in advance of her sister states, Kentucky has great coal fields, oil fields and, in particular, oil shale fields, which bid fair to play an important part in the oil problem of the next few years.

Rock asphalt deposits for road building in Western Kentucky, fluorspar in Cumberland, Livingston and Caldwell counties, are as yet only partially developed. Lead and zinc are recovered in association with barytes and fluorspar. In that portion of the state west of the Tennessee River and at a few isolated points in the southeast portion of the Blue Grass region are found excellent deposits of high-grade clays. Bentonite occurs in Central Kentucky and brines in Clay County. The finest flint

fire clay deposits in the Eastern United States occur in Greenup, Carter, Boyd, Rowan, Elliott and Morgan counties.

In addition to the already developed coal and oil fields, great undeveloped coal deposits lie on the headwaters of the Middle and South Fork of the Kentucky River and in Martin and Pike counties on Tug River. Many of the Eastern Kentucky counties, showing favorable structure, are as yet undeveloped in oil. Large deposits of glass sand occur in proximity with natural gas, while building stones and limestones of high grade are found in many portions of the

Alabama

Controlling great power resources in common with others of Tennessee, Arkansas and the Carolinas, Alabama is already constructing chemical plants, dye works, by-product plants, electric



Revolutionary Equipment

These electric steel furnaces, operating with artificial graphite electrodes, are revolutionizing the metallurgy of steel, enabling many medium and low-grade iron ore deposits to be worked successfully

smelters and cement works to keep abreast of the great wave of progress.

Arsenical pyrites and its treatment for the recovery of white arsenic is receiving special attention at this time. In addition to the high-grade coals of Alabama, the Louisiana-Mississippi lignites are also found in the southern part of the state, and for gas purposes, on ac-



Barytes Mining in Georgia

This open-cut operation of the Paga Mining Company, Cartersville, Georgia, is carried on in residual clay. The ore is washed in special types of iron ore washers, after which it is jigged and concentrated

count of the low percentage of tar, are of especial value.

The Alabama graphites are of recognized quality and extent but, like manganese and chromite, have been the victim of a vacillating tariff policy, and until such time as the tariff is taken out of politics and made an economic issue these great industries must continue a precarious existence rather than a vigorous activity.

Tuscaloosa County, Ala., is a veritable prospector's paradise. Gold and silver, Fuller's earth, tripolite, mica, pottery clays and fire clays, bauxite, iron ore, chalk, oil shale, tin, glass sands, asbestos, soapstone, talc, corundum, chromite, lithographic stone and fine granite are numbered among the great wealth producing minerals and potential resources of Alabama.

Georgia

Georgia has always been a steady producer of barytes, ochre, bauxite, clays and limestones, but has been unfortunate in the bitterness of many of her political struggles to the extent that industry has been in many cases seriously impeded thereby. Many of her products are shipped out of the state, only to be repurchased at a stupendous increase in price in the form of manufactured products.

The advent of hydroelectric power and the favorable interconnection of superpower zones has done much to stimulate quarrying and the opening up of the mining industry in the state and will continue to exert its influence not only in Georgia but in the Carolinas and Florida.

Georgia marble, superior to most marble produced in the United States, is shipped principally in a crude condition. Finishing plants should be established in order that another industry might be

added to the state's economic resources. In the same way mica, barytes and ochre, returning in the form of roofing paints and linoleum, might well be manufactured near the source of production.

The chlorite deposits of Cherokee County, used for foundry facings, roofing and insulation, have a promising future in combination with graphites and oil for lubricating purposes.

The copper deposits are analogous to those of the Ducktown districk of Tennessee. Feldspar, sericite and fluorspar, together with precious stones, magnificent serpentines and building stones, tale, soapstone and tripoli, contribute their share toward a min-

eral production which for successive periods of ten years each has been doubled.

South Carolina

South Carolina, with less mineral reserves than many of her sister states, and because of this having paid less attention to their study and development, nevertheless boasts of limestones or shell marls of high value for agricultural and cement purposes, glass-sand and clays, which need only skilled handling to produce high-grade products.

The barytes deposits of Cherokee County compare favorably with those of Georgia, and the products of the gravel pits near Dillon, along the North Carolina line, are sold for use in roofing, concrete and ballasting.

North Carolina

North Carolina of recent years, leading the van in industrial progress like her sister state, Virginia, has been endowed by the Almighty with a wonderful and splendid wealth both in diversity and quality of mineral deposits of clays and gypsum, of fluospar and limestones, iron ore, coal, glass sand, molding sand, rutile and ilmanite, mica, copper and many other valuable minerals.

Eighteen counties of the state possess high-grade clays for hollow tile, pressed and face brick. Rockingham and six other counties have extensive deposits suitable for the manufacture of buff and white brick.

Madison Cherokee and Clay counties carry ochre in combination with the brown iron ores.

Two-thirds of the feldspar supply of the United States comes from North Carolina, but there are nine counties where, until recently, the lack of transportation facilities has retarded development.

The limestone deposits on the Murphy branch of the Southern Railroad and at Hot Springs and Paint Rock, with coal easily accessible from Tennessee, offer splendid opportunities for the cement industry.

The decorative building stones of Yadkin, Mecklenberg and Madison counties have no competition in the United States.

The coal deposits of Moore, Lee and Chatham counties have been tested and found satisfactory for steam, gas and coking purposes. Plants should be installed near the mines to coke the coal, using the gas for power and supplying metallurgical coke and domestic fuel.

Electric smelting, made available

through the magnificent hydroelectric power of the state, in connection with chromite, monozite and zircon mining, offers attractive inducements; gold dredging in Burke County and the copper and silver deposits of the several western counties hold splendid reserves in basic value and offer promising fields for metallurgical research and economic operation.

Florida

This state, second only to North Carolina in her advancement, with Fuller's earth and the various clays, with limestone and sandstone and an almost unlimited deposit of phosphate rock, to which has been added great highway and railroad development, bids fair to become a cosmopolitan state in which touring, agriculture and industry have been well combined.

Fuller's earth, kaolin and glass sand and oxides of zircon and titanium are all actively produced and carry splendid reserves. Gypsum deposits are found in Sumter County and vast deposits of peat in the Everglades and other areas of South Florida are now receiving the attention of outside capital.

The utiliation of peat for microorganic fertilizer as well as producer gas for commercial purposes is also receiving the attention of several research engineers at the present time.

Book to Be Prepared

It is proposed to prepare the record of this economic survey in the form of a book, each of the chapters of which shall be devoted to one of these mineral resources, and which shall cover the known undeveloped deposits of the states in question. Supplementary thereto a second book will contain a résumé of the general condition confronting the mineral industry of the South, and will discuss in connection therewith the effect of such taxation, transportation, power, labor and ownership problems as at present confront the people of these states in the development of a great southern mineral empire. These books will be available to the members of the American Mining Congress and the leaders of industry everywhere who may be interested.

Virginia

As Pennsylvania anthracite becomes higher in price and reserves dwindle, the semi-anthracites of Virginia will receive increasing attention. The "Valley" coals of Montgomery, Pulaski, Wythe and Bland Counties, comparable to Lykens Valley coal, offer the only substitute east

of Arkansas for the high-grade anthracites.

The "gossan" operations of Virginia, the pre-revolutionary sources of iron, in combination with the pyrotites and pyrites, offer an inviting field for metallurgical research. The pyrotites of Carroll County form the only sulphite deposit in the South being operated primarily for the manufacture of sulphuric acid.

The iron ores of Virginia, of the same character mineralogically as those mined in the past, are by no means exhausted. There are many deposits which offer good possibilities for future production.

Lead, zinc and gold, if worked in an economic manner by experienced mining men, are available for profitable operation. The low-grade copper ores, occurring in basalt of pre-Cambrian formation, are not a steam-shovel proposition but are amenable to recovery.

Abundant supplies of building stone are found throughout the Piedmont section. The clays are well developed. The entire Valley of Virginia is limestone formation, unlimited in quality and quantity. In addition to the hard-rock limestones are extensive deposits of fresh-water marl, or "travertine," running from 90 to 95 percent CaCO₂.

The Coastal Plain is rich in greensand or glauconite marl, carrying valuable potash and low phosphoric acid content, and in shell marl of unlimited extent.

Barytes, pigment clays, lithographing stone, feldspar, cement shales and ochre are likewise receiving consideration by engineers and geologists of industrial plants who see the advantages of the state in its splendid railroad and water transportation facilities.

West Virginia

West Virginia must always remain in the rank of the great coal-producing states. Her diversity of minerals is not as great as some of the adjoining states, but her supply of high-grade limestones is equal to the best. These have been made the subject of special study by the State Geological Survey, and their extent and quality have been well defined.

There are still great areas of undeveloped coal land, ranging from the adjoining semi-anthracites of Virginia to the smokeless Pocahontas coals and those of New River, and from the splint coals of Tug River to the gas coals of Marion County. Early realizing the necessity of transportation facilities and communications, the industrial development of West Virginia has been far in advance of many other southern states.

BRINGING ABOUT INDUSTRIAL COOPERATION, AN ESSENTIAL ELEMENT OF GOOD MANAGEMENT

Responsibility Rests Heavily On Management—So-called Labor Problem More Question Of Status Than Distribution Of Income—Careful Selection And Promotion Important

By SAM A. LEWISOHN*

T would be ridiculous to suggest any panacea for the problem of industrial cooperation, but each year I become increasingly convinced that it is mainly a question of good management. This is to recognize that a very important element in management is the human organization problem.

When I speak of human organization I refer not merely to relations with the rank and file directly, though they are overwhelmingly important, but to the organization of the entire staff which affects the rank and file indirectly Labor relations are intertwined with a smoothly functioning industrial household. If there is friction or failure in organization at a plant, the rank and file of employes are as quick to feel it as children are to be affected by domestic discord. It is part and parcel of the problem of proper organization from the top down.

Labor problems must be approached as an integral part of general management problems. When we once reach this conclusion we no longer discuss the necessity of both sides cooperating, but rather we discuss the responsibility of management to exercise the initiative to bring about such cooperation.

We can candidly recognize that there are certain complications inherent in relations with the rank and file which do not apply to relations with other members of the organization. These consist both of general complications, present in every case, and special complications that are unique to the situation at a particular plant. It is the

responsibility of management to study these general and special difficulties and complications with as much solicitude as it does its physical problems.

Mining executives are all too apt, because of their special training and special tastes, to concentrate on physical engineering problems at the expense of human engineering problems, though I think that there has been a notable improvement in this direction in recent years.



Sam A. Lewisohn

One of the most evident of the general complications is the so-called class consciousness which is largely a question of division between those bossed and those who do the bossing. For the so-called labor problem is more a question of status than it is a question of the distribution of income.

We must remember that after all in industry those who direct are not chosen by those who are directed. This is necessary from the point of view of efficiency, but it makes it all the more incumbent upon those who do the directing to be tactful and to give thorough attention to the human problems of directing.

Now certain principles of tact, good will and justice are important, but it is also true that more than a general application of these principles is necessary. Farticularly in a large organization it is essential that the best methods be utilized for applying these principles.

This means the careful study and adoption of the best ways of selecting, placing, promoting and training workers. It also means that attention must be given to a continuous method of foreman training, and to such things as scientific working conditions, proper medical attention, methods of introducing the employe to his job and explaining the policy of the company to him. And most important of all, it includes a proper method of consulting with the workers from time to time, whether through a formal system of employe representation or in a more informal fashion.

Experience has demonstrated that by the application of all these methods a relationship can be built up that will secure the full cooperation of the workers in increasing efficiency and enlarging production. In all these matters there must not only be no taint of patronization but every means must be utilized to maintain the status, dignity and self-respect of the individual worker.

Metal-mining executives probably have been more progressive than any other group of executives in working out and applying new devices of a mechanical and physical nature for making the industry more productive. They should maintain this tradition in their approach to the problems of human organization.



Ransome, U. S. Geological Survey Miama Plant and Concentrator, Miama District, Arizona

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EDUCATION AND INDUSTRIAL UNREST

Satisfied Employes Best Method Of Educating The Public—Training Not Only Mine Foremen, But All In Official Positions, Urged—Confidence Real Key To Contented Industry

By J. S. LUTES*

In discussions of industrial cooperation the advantages to be obtained in political and legislative ways, as well as those to be gained from increased efficiency and elimination of labor troubles, seem sometimes overlooked, and to me these advantages are often important enough to warrant their receiving more prominence, thought and discussion.

The widened gap between employer and employe which has accompanied the development of modern industries and the formation of ever larger industries in all lines through their natural growth, combination and mergers has brought about misunderstanding and distrust of each other's motives not only between owners of industries and the employers but also between a considerable portion of the general public and industry. In the beginning, manufacturing and trade were carried on in such small units that not only the employes of an enterprise understood the aims and problems of the owners but the local public generally could see and largely understand what the employer was up against. That which could not be easily visualized by an outsider was frequently discussed by the employer and his neighbors, so the latter were usually in an informed, if not actually sympathetic, condition. Tremendous growth of centers of population concurrently with the growth of industry made a breach in the feeling of common interest once felt by great numbers of the outside public toward industry in general, or sometimes toward specific industries, which in many cases is greater than the gap between the employer and employe. Many times it is even more difficult to overcome. You cannot invite a committee from the portion of the general public which is antagonistic to meet with you across a table, discuss misunderstandings, arrive at some conclusion with your committee, and then expect that the antagonistic part of the public will listen to the committee report. They would not be interested. Your committee could not get an audience. But you can thresh out some differences with employes this way and get to better understandings.

Education has been suggested as the real remedy for most economic and industrial ills, and the resolution of the American Mining Congress at Milwaukee, calling for the development of plans for the systematic training of foremen,

is a step in this direction. The development of such courses of training and the consideration of the points involved will



J. S. Lutes

By endeavoring for closer contact and by manifesting a more sympathetic attitude toward the employes all the way through the organization from the officers down, we can obtain the desired harmonious organization and the employer will again have the confidence of his employes. But to gain and hold this confidence he must be scrupulously careful to see that faith is always kept with the employe. Contracts made should be kept. The employe should feel, and has the right to feel, that "the company" will stand back of its word without a written contract.

doubtless throw new light on other sides of at least some of the questions brought up for most of the committee engaged in this work. It is indeed seldom that any one man knows thoroughly all phases of the other man's viewpoint. And this brings us to the point that any well-founded program of industrial cooperation should start at the source—with the

shareholders, if possible. Failing this in larger enterprises, the board of directors, officers and managing executives should be as fully imbued with the spirit of cooperation, as fully posted and interested in the employe's troubles and as loyal to the organization as we would wish to see these qualities in our employes.

Too many times we see not only foremen but minor executives, or even those in more responsible positions, plainly content with merely "getting by." With such examples given him by men in positions designed for responsibility-by men who through training or education should have thoroughly in mind the business application of Roosevelt's doctrine of the square deal, that to expect much from your employer you should at least give your best-is it any wonder that the workmen or laborers who are frequently charged with loafing or soldiering on the job should not always give to their employer all that they can. The local boss or foreman who is late getting on the job must not expect his men to be there much before him. That is one of the first lessons in management of men, and the same principle of setting an example and being on the job should be kept in mind and carried out by the "heads" of the business if best results are to be obtained. This matter of setting an example is, of course, one of the best means of influencing men and should be kept in mind and followed by all, from the highest officials and manager down. This only carries influencing of the employe a little higher than is usual.

The education of foremen which is to be undertaken by the Mining Congress should not stop with the under bosses but should be carried on down to the bottom of the organization to as large an extent as possible. Likewise it should be carried on up from the foremen, so that the higher officers of the organization will also continually have in mind the principles which it is desirable to follow in the handling of employes. In the old days in the small units the owner had the confidence of the employe, through daily contact and observation, and at the same time the employe felt himself an important factor in the success of his employer. He took pride in the work he was doing and the product which he helped to make, and I think that this sense of responsibility which comes to the workman when he is made to realize that his is as vital a part

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in the making of a product as that of any other man, the feeling that he is an essential part of the organization would tend to restore to the workman some pride of position which was his in the small units of the early days and which would prove to be a great steadying influence in making the employe more receptive to statements of the employer's position and bind his loyalty to the organization. This attitude of the workman can best be obtained if all of the organization's staff, from the highest officials down, would make more of a conscious effort to recognize the accomplishments of the employes, whether the employe in question be a laborer on the track or whether he be one of the officers occupying an eminent position. This attitude should be encouraged and built up in as earnest a way as college men work to build up a feeling of so-called class or college spirit. The whole of an organization should be as interested in its success, and if they can only be made to realize it and bear it in mind, they are more vitally concerned with their organization's success than is a college student in the success of his school. Likewise the employe must be brought to understand that the part played by the directors or general officers who may come from a distance and be seen only at rare intervals on inspection tours is as necessary as their own manual labor-even though it does not involve calloused hands and grimy clothes.

It may be suggested that in some of the industries that are highly organized and that have had bitter labor troubles, as in some of the coal fields, this question of imbuing the man with a sense of the importance of his position needs no further development, but the views herein expressed are directed principally toward such parts of the mining industry as are not in such an unfortunate condition and where it seems possible that through the proper foresight and development of industrial cooperation, though it may not be known by this specific name, such unfortunate conditions may be averted.

By endeavoring for closer contact and by manifesting a more sympathetic attitude toward the employes all the way through the organization from the officers down, we can obtain the desired harmonious organization and the employer will again have the confidence of his employes. But to gain and hold this confidence he must be acrupulously careful to see that faith is always kept with the employe. Contracts made should be kept. For example, if contract rates are set too high through faulty calculations of foremen or superintendents and then these rates are not honored by those in authority when it is evident that the employe has made more than was expected, it is going to be very difficult to hold this man's confidence in the future. The fault of this condition is obviously not that of the employe in making more than was expected but is the fault of the one setting the rate and might result from inexperience or carelessness. This is cited merely as one example of things which may shake an employe's faith in "the company." The employe should feel, and has the right to feel, that "the company" will stand back of its word without a written contract.

If an organization's employes are brought to this state of loyalty and confidence which we desire, they will, in their conversations and contact with people in other walks of life, scatter the idea that the corporation or industry in question may not be all bad. If he through square dealing and kindness (not paternalism or pampering) is brought to have a friendly disposition toward his particular company his attitude toward all of that industry is apt to be friendly and he will not be nearly as good material for the rabid soapbox orator or labor agitator to work upon.

Contented, loyal employes who know they are getting and can depend upon getting a square deal, and that is all the majority wish, make the greatest defense against the exaggerated statements of that small but very evident and oftentimes troublesome minority which would exploit labor unrest. Employes in this friendly frame of mind with the realization that they really are a part of the industry themselves will not be apt to vote against the interests of industry, and of course the plan of education which may eventually be worked out will bring home to all that the interests of the employe are identical with those of the employer insofar that the success of the industry in question is essential for the continuance of employment, and that anything that will cripple the industry will almost directly work to the disadvantage of the employe through wage reductions or shut-downs that may be necessary to save the property from total loss.

Various parts of the mining industry in this country have been severely handicapped through unjust legislation, both in the form of laws designed solely to make more jobs or unreasonably limit those who fill them which are passed by the legislators under the guise of safety or humanitarian laws, and excessive or discriminatory tax legislation. These laws are not always passed in a spirit of vindictiveness in a vague endeavor to "get even" with "corporations," but they are largely passed by legislators who have not a clear understanding of both sides of the question at the instigation of a small minority seeking to benefit selfishly. I think that the most of this legislation is tolerated because of the gap in interest and understanding between industry and the general public mentioned in the forepart of this article, and the public's distrust of the motives of those managing industry and of any statements made by industrial managers.



Manganiferous Iron Ore Mine, Cuyuna Range

And right here I would comment on the attitude of industry toward such unjust legislation when once it is enacted. If any law is felt unfair I think it should, so long as the officers of industry feel such injustice and speak of it among themselves, be kept before the public for discussion until such time as the public is educated sufficiently to see it from the industry's viewpoint, or until sufficient additional information is developed from the other side so the industry itself is fully convinced the law is equitable and for the best. It seems a mistake to quietly, and so far as the public knows cheerfully, accept any piece of legislation merely because you are afraid that if the question is again opened some law more severe will take its place. This merely invites another dose.

This, of course, has in mind that legislation proposed by both industry and the public in harmony is best for all concerned. Fair legislation proposed by industry is equally as good for the public. Such a harmonious condition of understanding with the public is always best for the employe, as under such a condition of harmony the soapbox orator in preaching his unsound or vicious doctrines would find small audience. These agitators, presenting only one narrow side of most questions, cause distrust between employe and employer, and if their audience could be eliminated a large step would be taken to the end desired.

The surest safeguard against such legislation is the education of the public from which the legislators are elected and the problem is to find a means for the public's education as well as the education of mine foremen. Certain industries have overcome some of this feeling through advertising, either in the papers or magazines, or on cards posted on their own property, such as the street railway companies have used in late years. Other industries, such as American Telephone and Telegraph Co. and public utilities encouraging consumer ownership have obtained a better public understanding of their problems through a widespread distribution of their securities. These industries, however, are fortunately situated in that their business is stable and their securities can be purchased with little hazard of loss. Unfortunately this is not true of mining enterprises, and it seems this means of education is blocked to us because of the hazards of our business. Obviously we can urge none of our employes to invest his savings in a venture which we know to be at least semi-speculative and which may wipe out the savings of his life time, although this is perhaps the quickest way to give to the employe the

viewpoint of an actual partner in the enterprise.

It seems that any education of the public as to the mining industry should come from some other direction, and personally I think that if we bring an employe to the condition of loyalty and confidence above mentioned, he in his contact with those of other walks of life is going to speak of his friendly feelings toward his organization, his confidence in its motives, and that he will defend the industry against loose accusations, so that through our satisfied employes we may find the best method of educating the public. Where a man outside the

mining field will not read a carefully prepared statement which may detail accurately and exactly all the problems of the mining industry, he will in friendly conversation give an interested ear to a contented employe who may be telling of some of our difficulties.

I feel considerable attention could well be given to this subject to the end that the efforts of those seeking to make political capital at the expense of industry generally may be blocked and the industries receive the same fair deal in legislative matters that the employes seek and are entitled to in their relations with their employers.

PUBLIC OPINION AND THE COAL INDUSTRY

Public Creates Congested Condition—Problem One Of Industrial Relations — Jacksonville Agreement Unfortunate — Minority Rule—Collective Bargainers Not Collective Bargaining—Recognition Of Rights Of Others Necessary To Permanent Solution Of Problem

By HARRY N. TAYLOR*

HERE is a deep rooted opinion in the public mind that the reason for the frequent disturbances in the coal industry is collusion between the organizations of the industry. This is an opinion and has no basis in fact. Why should the coal industry be more wrong than any other industry? It is not. It is simply less understood. Being basic, it affects many people, most of whom are prone to express an off-handed opinion.

The public often create a condition of congestion through failure to purchase coal except at its own convenience and then kick at the coal industry for failure to overcome a temporary shortage that the buying public itself has caused to exist by delayed and concentrated demand.

The real cure is one of industrial relations. All operators and miners of coal have a direct community of interest. This is lost sight of when certain operators and certain miners in all the twenty-eight coal producing states insist that they have rights to which all other operators and all other miners must surrender.

A glaring example of this is the present Jacksonville agreement. Agreed to in its original form by operators representing a relatively small percentage of the production of the country, but forced upon all other union operators regardless of competitive conditions, it has depressed the bituminous coal industry as a whole to the lowest depths.

*President, United States Distributing Corporation.

The non-union fields were not bound by this agreement and were free to adjust their mining scales locally. This unfortunate agreement has made the principle of collective bargaining a farce. The great majority of the coal production of the country was not properly represented in the making of this contract either on the part of the operators who owned the mines or the miners who produced the coal, who were represented only by their professional leaders. These leaders acted without the men at home knowing the policy to be pursued or what the effect of such policy would be upon their local conditions. The Jacksonville meeting was a collection of bargainers, and not collective bargaining.

The sad result of such action under the misnomer of collective bargaining is weighing heavily alike on the union miner and union operator in all union fields. With the union fields competitively disposed of by the Jacksonville agreement, the non-union operators are now making the mistake of destroying each other by unreasonable competition.

When operators in certain non-union mining districts and miners in union districts recognize that both operators and miners in every coal producing district have rights which both operators and miners should respect, there will be established a common basis upon which the whole labor problem of the coal industry can and will be intelligently and permanently solved, and not until then

MINERS' ATTITUDE TOWARD INDUSTRIAL COOPERATION

Industrial Cooperation Means Industrial Friendship—Miners Ask That Their Executives Become Familiar With Underground Conditions By Frequent Visits In The Mines—Employer's Interest In The Laborer's Home Life Is Conducive To Company Loyalty

By THEODORE MARVIN

HE miners' basic attitudes and suggestions toward industrial cooperation align themselves quite closely to the human side of engineering. This is true whether they are of the East or the West, whether employed in coal mine or gold mine, in zine, lead, iron, or in other mines. To the miner, industrial cooperation means industrial friend-ship—a condition that is not yet commonly prevalent in the dealings of capital or labor with each other.

There is no doubt but that the corrective prescription for this state of affairs is the conference table where industrial differences can be quickly and satisfactorily settled by representatives of employer and employe, providing each is mutually interested in the welfare of both. But to be mutually interested in the welfare of both requires of each representative a true understanding of the problems which confront the other. Education will solve these problems, theoretical education for the foreman, shift-boss, and miner; but only actual practical education, obtainable in no other way than by definite contact with the laborer at work and at home, will suffice in the case of those who are vested with the duties of handling the men and money employed in mining enterprises.

Therein lies the gist of the miner's appeal and suggestion to the men who head his company, the men with whom he rarely—except in a few cases—comes in contact. Nothing would please a laborer more than to have his employer accompany him underground for the purpose of becoming closely acquainted with the working conditions as they are within the mines.

Much of the disquieting talk one hears

from miners about bad underground conditions directed against their employer because, to them, his continual absence from the place in which they work means a disdainment of their welfare, and a lack of interest in their safety. A surer or quicker path to industrial peace cannot be found by the mine operator than that which leads down the shaft, through tunnels and cross-cuts, into the stopes and to the face. By following this path, the executive will learn about the hazards of mining, not second-handedly, but by actual observance. He will appreciate—even during his brief visits—the value of safety methods; and the realization that more are needed will be firmly and vividly impressed upon his mind because of his contact with existing dangers.

Such visits into the mines by the heads of companies will serve to clear up another irritation which has long been one of the chief causes of industrial discontent. This, simply and briefly, is that miners are tired of being classed as a mob and treated as a flock of sheep—as they are in some places and by some people. An employer who still holds that attitude need expect no more cooperation from his employes than he should from a mob which is a mob in reality.

The miner asks for a square dealhumanly. He asks the chance to show his superior's that a man can be a miner and yet be human, and that he is not as uneducated, or as unversed in the events of local and world importance, as is commonly supposed. Underground contact with the miner will show the employer the laborer's real self. He will discover him as being hugely interesting, and well able to discuss labor problems with a clearness and directness that makes printed treatises, in comparison, appear as aimless wanderings around the subject of industrial relationship. It seems strange, because of the small amount of time and trouble expended in return for the good derived by both employe and employer, that the personal touch, fostered by these visits, is not a regular part of every day's work.

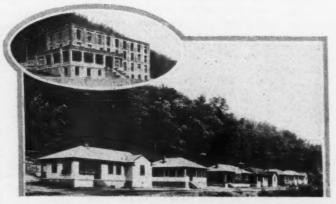
The spirit of friendliness, which is

bound to come into existence when "the boss" begins to take an interest in his personnel, will spread spontaneously through his organization, paying dividends in happiness as well as in prosperity. It will result in less of that wretched practice of "passing the buck," from executive to superintendent, from foreman to shift-boss, and back again from the miner upwards. Promises, hitherto made only to be broken, will be kept. Adherence to these better principles will instill faith between all employes, a faith which must be existent before company loyalty is achieved.

Nor should the employer's interest toward the miner be in evidence only during work hours. He should enter into the home life of the laborer, sharing alike its joys and its sorrows. The problems incurred in the shaping and guiding of young minds so that they may better share in the privileges and duties of citizenship in later years should be studied. Housing conditions, community pride, and recreation features are subjects which deserve the best of the executive's attention, for upon these things rest the success or failure of any industrial plan that may be instituted. Broken-down houses, lining unkept and unattractive streets are not conducive to neatness or ambition within the home or in the mine, for the miner, as is true of other people, is influenced directly in his work by the surrounding environment, which in mining camps is most assuredly the visible attitude of the company towards its employes. If provided with a proper place to live in, the miner can be counted upon to maintain and improve the standard set for him.

Thus the miner's attitude towards Industrial Cooperation is proportional to

the interest which his company and his employer takes in him, personally. When executive and laborer have become more intimately acquainted, when the human side of the miner is considered at work and at home, and when both have become familiar with the problems of each, then will be the time when miners and company officials can settle their differences in a friendly manner over the conference table, and the era of industrial friendship will have



The Raleigh-Wyoming Coal Company, Glen Rogers, West Virginia

COOPERATION IN INDUSTRY

Enlightened Industrial Management Recognizes Need For Direct Negotiation And Mutual Understanding—Broad Principles Of "Pennsylvania Plan" Outlined—No Panacea Advocated — Tremendous Progress Has Been Obtained By Recognition Of Each Other's Rights

N a recent issue of the MINING CONGRESS JOURNAL the Secretary of Labor, Mr. James J. Davis, says: "Our great industrial need in America is cooperation. Before we can have cooperation we must have understanding, the understanding of each other's needs. Industrial peace will never be achieved through laws. The remedy lies not in governmental interference be tween worker and manager, but in direct negotiation and mutual understanding."

Enlightened industrial management has recognized this need for many years. Many sincere efforts have been made in widely differing industries to bring about that spirit of cooperation which springs from mutual understanding, from a recognition that employers and employes both have a large stake in their joint enterprise, and from the realization that their individual as well as their collective interests will best be served by working out their difficulties amicably

The problem is one that engages the thought of practical executives and farsighted leaders of labor, as well as students of industrial relations in the ministry, the press and other walks of life. A great deal of progress has been made. But it would be rash indeed to say that any one method offers "the" solution. Conditions in different industries are too varied to permit setting up any one plan as a panacea. On the other hand, as indicated by the Secretary of Labor, the principles to be followed are simple and fundamental.

One of the difficulties in the way of a more widespread success with attempted methods of cooperation in industry lies, no doubt, in the approach to the problem itself. Too often the conception of the relationship between management and men is that it is inevitably one of continual strife. Such a view is essentially unsound and the public, insofar as those industries are concerned which affect the public directly, will no longer tolerate it.

This attitude on the part of the public is notably true with respect to the railroads. At the same time there is a particular need for cooperative effort in railroad operation entirely apart from human considerations or the pressure of public opinion. In the railroad industry the income as represented by its transportation charges (which is the selling price of its product), wages, and a great part of other operating expenses (con-

By SAMUEL REA
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stituting cost of production) are beyond the control of management, being under strict governmental regulation. There



Samuel Rea

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is left a relatively small margin out of which management is expected to produce satisfactory net results. In no small measure success in any appreciable degree depends upon ability to utilize every opportunity to increase the efficiency of the whole transportation machine.

In this respect the personnel of the railroad organization offers a fertile field for the development of real cooperation. Constant supervision over employes of a large system scattered over

a wide territory must necessarily be delegated to the responsible officers on the ground, but in many instances employes have it in their own power in the performance of their routine duties to turn deficits into profits, or to make successful and satisfactory operation when otherwise without such personal interest the results would be unsatisfactory.

Under our present system of governmental regulation, competition between railroads is to a large extent one of service, which in the final analysis may be reduced to terms of the employe's attitude toward his job, his company and the public. This competition in service extends to railroad employes in practically every occupation, and efficiency of operation is made up of many factors too numerous to mention.

It may be helpful, therefore, to those who are interested in the general subject of the relations between capital and labor to consider briefly the plan developed on the Pennsylvania Railroad System which offers an outstanding example of cooperative methods in actual practice. This plan has been in operation during three years of difficult railroad operation and has met most exacting tests on a railroad which performs more than 10 percent of the country's transportation service and has the largest number of employes.

The principal features of the Pennsylvania plan are generally well known. In some quarters, however, the purposes of the plan, its operation and success have been subject to no little misrepresentation and misunderstanding. Notwithstanding all this, it is more firmly established today than ever, and is a working success.

Modern labor policy recognizes that employes in industry have certain essential rights, such as an adequate wage, time for recreation, opportunity for advancement, and a voice in determining the rules and regulations under which they shall work.

Granted these, it is visionary to think that employes seek the responsibility of management. It is no doubt true that most dissatisfaction among employes is due to lack of knowledge of the facts, or suspicion that the facts are not what they are represented to be, or both. Under the Pennsylvania plan this cause is almost entirely eliminated by reason of the fact that decisions affecting the

employers' interests are matters of joint

The basic principles underlying the Pennsylvania plan of employe-management relationship are these:

- 1. Faith in each other.
- 2. Facts jointly established.
- 3. Fair play.

Our labor policy reduced to simple terms is just the old-fashioned method of sitting down around a table as friends and partners in a common enterprise and talking over the facts of a situation for the purpose of reaching a common understanding. Our theory is that men are fair and reasonable when they know the facts; that employes and management have an equally vital stake in the railroad; that their individual success is determined by the success of their joint enterprise and that negotiations and agreements arrived at from the bottom up and not handed down from the top, or from the outside, are conducive to mutual understanding and satisfaction.

Now as to the practical means by which this policy has been put into effect. Briefly, the fundamentals of the Pennsylvania method are these:

1. An opportunity for all employes to have a voice in the management in matters in which they are directly concerned (wages, working conditions, etc.) through employe representatives elected by themselves, regardless of whether they are union or non-union men.

2. Establishment of a mutually satisfactory method of promptly settling all controversial questions arising between management and men.

3. Establishment of a joint tribunal for each class of employes, equally representative of employes and management, which is the final arbiter in the disposition of industrial disputes.

It is recognized, of course, that an employe has a right to join or not to join any organization, but membership or non-membership in any organization does not concern the management. The primary requisite is that the employes and the management deal directly with each other, that spokesmen for the employes be employes themselves, chosen by the employes, speaking and acting for the employes and not taking orders from or acting for persons or organizations outside the Pennsylvania System who have interests to serve other than those of the railroad, its employes and the

Such a basis is fundamentally sound, It is of paramount importance in the interest of the public-which requires adequate, efficient, economical and uninterrupted transportation service - by reason of the fact that the sympathetic strike, the closed shop and restriction of output are countenanced and practiced by certain organizations which during the period of federal control very largely extended their membership among railroad employes.

On the other hand, it should be clearly understood that the Pennsylvania plan is not anti-union. The fact is that in several branches of the service, namely engine and train service, signalmen and telegraphers, the company is dealing with committees of employes all of whom

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are union members. Furthermore, not only does the Pennsylvania plan recognize collective bargaining but it is based primarily on that very principle. Collective bargaining means dealing through chosen representatives instead of individually with each employe.

In operation the plan is this: Committees of employe representatives meet regularly with local officers, division and general superintendents and general managers. Dates of meeting are specified and delays due to evasion are im-If questions brought up possible. locally are not settled locally they may be taken on up through the higher officers to the general manager, five days' notice in advance being given by either party of a subject to be discussed. If not settled in the meeting with the general manager, the highest operating officer, they go to a joint committee.

The latter is the keystone of the plan-a joint reviewing committee for each class of employes, equally representative of employes and management-a committee in which all members have equal voting power, and two-thirds vote is necessary to decide any question. If the committee itself is unable to settle the issue raised, it determines how the issue shall be settled-by reference to arbitration or other means.

All meetings from the bottom to the top are consecutive and spaced in point of time so that a disagreement between the local committee and a superintendent can be referred to the general superintendent, allowing the necessary five days, and in case of disagreement there, to the general manager, with the necessary five days' notice, and finally, if necessary, to the joint reviewing committee-all within a short cycle of time, not exceeding 60 days. Ordinarily the time is reduced to about 30 days. In the case of matters involving an interpretation of working agreements, the procedure is quickened by direct reference, in the event of local disagreement, to the joint committee for interpretation.

Naturally there are a great many regulations governing the procedure outlined, but it is not considered necessary to go into details here. It may be stated, however, that the three principles already mentioned apply to the formation as well as the negotiation and execution of these regulations. Having worked out jointly the method of conducting elections, the elections themselves are conducted almost wholly by employes, the management giving only such assistance and advice as is requested. Influence, intimation or intimidation on the part of the management are impossible under the Pennsylvania

Obviously this plan has certain very definite advantages from the standpoint of the employes, the public and the company itself.

First, as regards the employes themselves.

- 1. It gives the individual employe, regardless of his membership or non-membership in any organization, an equal voice with his fellow employes in choosing representatives to deal with the management on all questions affecting his interests. Through regular secret elections, it gives him a real opportunity to voice his desires and make certain that his representatives really represent
- 2. It insures prompt, orderly hearing and adjustment of grievances.
- 3. Through democratically elected representatives, it gives the employes an equal voice with that of the management in deciding matters in which they are directly interested.
- 4. It has the whole-hearted support of the vast majority of the employes, the various elections showing actual participation in the voting of from 75 to 90 percent of the employes concerned, the percentage of void ballots in all elections being only about 5 percent of the total number eligible to vote. This is a far higher percentage of eligible voters participating in an election than is true of state, municipal and other elections.

5. Through the system of appeals provided for and the consequent check by higher authority and finally by the joint reviewing committees on decisions of local officers, it insures to the employes more careful and sympathetic consideration of individual grievances.

6. Finally, it is a working success, as shown by the records of cases handled through the employe representation plan.

During the year 1923, 13,485 cases were taken up with individual officers from those below the grade of superintendent on up to the general manager. Of this number 6,279, or 46.4 percent of the total, were adjusted or compromised in conference without appeal. Appeals were taken in 3,341 cases, or 24.8 percent of the cases handled. In 3,865 cases, or 28.6 percent of the total, the matter was withdrawn as having no merit or for other reasons.

In less than 1 percent of the cases taken up on behalf of the employes was it necessary to take appeals to the reviewing committees, a mutually satisfactory settlement having been reached with the local officials or next higher authorities. The actual number received by the reviewing committees in the year was 149. Of this number 65 were decided in favor of the management, 37 in favor of the employes, and 47 were withdrawn or remanded after reaching the committees.

Second, as regards the public.

 The Pennsylvania plan offers practical assurance of uninterrupted transportation.

No more conclusive evidence on this point could be offered than the performance of the Pennsylvania Railroad System during the shopcrafts strike in 1922. Operating under the employe representation plan, with wages and working conditions negotiated by the management and employe representatives, two-thirds of the Pennsylvania shopmen remained at work in the face of a national strike and enabled the company to carry not only its own share of the country's traffic but a large part of that of its neighboring railroads whose service was more seriously affected than that of the Pennsylvania.

2. By establishing a mutually satisfactory understanding and working basis between management and employes, the public is assured of service by a more contented body of employes, a condition which cannot help but be reflected in courteous, efficient, thoughtful service.

Third, as regards the company.

1. The Pennsylvania plan has enabled the company to negotiate and agree with its employes on the most important questions affecting their mutual relationship—wages and working conditions without recourse to outside agencies. Among all classes of employes during the three years of successful operation of the plan, only three matters have been referred to the joint committees which failed to be decided by those tribunals in regular procedure. In one case the matter was settled by arbitration, by arbitrators selected by the committee, and in the two other cases the matters were placed in the hands of a joint sub-committee for special investigation and recommendation. Upon the findings of these sub-committees the cases were decided.

2. The company has been enabled to establish a spirit of mutual confidence between officers and employes to such an extent that procedure heretofore unprecedented has been adopted in the disposition of different questions.

The recent wage demands of the train service employes were settled on the basis of facts gathered by a joint fact-finding committee equally representative of employes and management, and in two other classes similar committees are now at work.

In several regions joint committees, equally representative of management and employes, have been appointed to study and report upon such matters as whether piece-work or day work should be the rule in enginehouses and upon improvements in the enginehouses themselves to increase productive efficiency.

3. The spirit of cooperation developing throughout the system has taken form in many ways, for instance:

Representatives of the employes in certain sections have taken upon themselves an active solicitation of business for the company.

Representatives of the employes have organized campaigns to reduce loss and damage to freight and to increase efficiency at freight transfer stations,

 Interest has grown in the securities of the company on the part of employes, and purchase of stock by employes has considerably increased.

Naturally, the Pennsylvania officers and employes regard their accomplishment in the last few years with a great deal of pride—not, however, with any feeling that what they have done offers the final solution of the industrial relations problem in all industries. But our experience tells us that we have found a practical, mutually satisfactory and actually successful basis of cooperation between management and employes. It has already produced substantial results and it gives promise of increasing benefits to all concerned.

EXPERIMENTAL FURNACE

A NEW experimental iron blast furnace, which embodies all the best features determined by observation of

the performance of other furnaces constructed by Interior Department specialists, has been completed and blown in at the Minneapolis experiment station of the Bureau of Mines. The new experimental furnace is larger than the one constructed by the Bureau of Mines at Minneapolis last year, which was the first successful experimental blast furnace in the history of metallurgy. It is expected that metallurgical studies made possible by the construction of the new blast furnace will reveal valuable information relative to the production of spiegeliron from manganiferous iron ores, which cannot be smelted under Since the United present practice. States has tremendous reserves of these manganiferous iron ores, the problem of their successful smelting is one of great importance to the iron industry,

The present furnace, which was erected in cooperation with the University of Minnesota, is 36 inches in diameter at the hearth and 30 feet high. The first run lasted 10 days. Air was supplied to the furnace at the rate of about 600 cubic feet per minute, consuming approximately 8 tons of coke per day. From 15 to 20 tons of spiegeliron of varying manganese content was produced during the experiments.

The most striking feature of the furnace experiment in contrast with previous ones lies in the fact that a rather complete survey of the composition of the gas stream in the furnace shaft was possible. By introducing water-cooled sample tubes through various test holes it was possible to cover completely six planes. As early as 1839 Bunsen determined the composition of the gas in the blast furnace at various elevations from the tuyere to the stock line. His results have been duplicated in a dozen or more investigations. In all this research samples were taken from only one point in each horizontal plane. During the thirty-fourth and thirty-fifth runs with the Bureau of Mines furnace over 1,000 gas samples were taken at five elevations in the furnace shaft, These samples, however, all lay along a single diameter of the furnace section. The necessity of sampling over a complete section has long been recognized, but the difficulty of obtaining such samples in practice has heretofore not been overcome.

A study of the analyses of samples of gas removed from the charge column within the furnace should throw considerable light upon the mechanism of the gas reactions taking place within the blast furnace shaft and should result in the obtaining of much valuable information relative to the production of spiegeleisen from manganiferous iron ores.

RESPONSIBILITY FOR UNWORKABLE TAX LAWS

Complicated Laws Necessitate Intricate System Of Departmental Procedure—Taxpayers Often Ignored By Congress While Non-Taxpayers Dictate Unfair Provisions— Simplified Common-Sense Law The Only Remedy

By McK. W. Kriegh

NOTHER tax revision bill will be introduced in the next Congress. No one is satisfied with the provisions of the 1924 Revenue Act, either with the rate schedules or the administrative sections. However, if the next bill is to be made a football of politics and a crazy-quilt of impractical and illadvised taxation theories, no taxpayer, even though dissatisfied with the present law, will want to have added to his already overwhelming difficulties, the intricate problems of a new law.

At each session of Congress for several years a new income tax bill has been introduced in the House of Representatives where all new revenue legislation must originate. And the Senate, under its constitutional powers, has amended and rewritten every bill that has passed the House. Since the ratification of the income tax amendment to the Constitution in 1913, six major income tax laws-the Acts of 1913, 1916, 1917, 1918, 1921 and 1924-have been enacted into law. Each act has been more complicated than its predecessor. Each act has imposed greater administrative difficulties upon the Treasury Department. Each act has been harder for taxpayers to interpret and understand.

Most of the trouble encountered by taxpayers · in the adjustment of tax liability has been due to defects and inequalities in the revenue laws. It was thought that conditions would be improved by the Act of 1924, but when that act finally passed it was found that more attention had been given to the reduction of rates than to the problem of simplifying the administrative provisions which determine the amount of taxable net income against which the rates are applied. Consequently, it is probably true that the present law is the most involved and complicated tax law ever placed on the statute books by any government in the world. The new administrative provisions which were added to those reenacted from previous laws undoubtedly will add to the congestion in the department, and may soon result in a complete breakdown of the administrative machinery of the Bureau of Internal Revenue.

ADMINISTRATIVE DIFFICULTIES GREAT

As the collector and custodian of the public money, the Treasury Department has had to evolve and promulgate rules and regulations of procedure for the determination of taxpayers' rights and liabilities under the revenue laws. Each new law has made necessary the revision of these rules and regulations. All previous attempts to amend and clarify the administrative provisions of the tax law have, in many instances, resulted in greater confusion and difficulty. It is

A simpler tax law can not be formulated and enacted unless the tax payers who pay the federal tax bill are given more consideration. Less than eight million persons are required to pay income taxes. More than twenty million persons pay no income tax, and are not even required to file returns because of personal and other exemptions and deductions. If representatives of these twenty million are permitted to dictate provisions of the law, the rate schedules, and taxation policies, it will be impossible for Congress to alleviate existing administrative difficulties.

not surprising, therefore, that departmental rules and regulations, in conforming to the requirements of, and in seeking to properly interpret, a series of laws that overlap in their application, have become extremely technical and procedure thereunder a hotchpot of red tape.

What the 69th Congress will do is a matter for conjecture. The situation is clouded with uncertainties. No one can forecast the political complexion of the next Congress. It may be that the 68th Congress, at its short session beginning in December, will undertake to remedy the situation. A select committee of the Senate is conducting an investigation into the affairs of the income tax unit of the Bureau of Internal Revenue. This committee, at the beginning of its investigation, devoted its hearings mainly to cases in which the Secretary of the Treasury, Mr. Mellon, was supposed to have a personal interest, but nothing of a scandalous nature was disclosed, and the facts ascertained by the committee indicated that the government apparently had the best of the situation in these cases.

The select committee is not satisfied and is continuing its investigation.

Disgrunted and discharged employes have intimated that certain taxpayers have been unduly "favored" in settlements of tax liability with the income tax unit. Charges of "incompetency" and "inefficiency" among employes of the unit have been carried on the wings of gossip. Demagogues have charged that the Bureau of Internal Revenue is a "hot-bed" of graft, crookedness and inefficiency. This gossip and these charges have been utilized by some for the purpose of creating campaign The Senate investigation "issues." should disclose the facts. Its report to the Senate should be sufficiently comprehensive that it may provide a basis for needed simplification of the administrative sections of the law. No one who has had direct and continuous contact with the income tax unit entertains any fear that the committee will find the unit imbedded in graft.

NON-TAXPAYERS MAKE TROUBLE

Strange as it may seem, a whole lot of people who pay no federal taxes whatever, who have no trouble with the Bureau of Internal Revenue, who have never been required even to make out an income tax return, and who know nothing whatever about the defects, inequalities and technicalities of the income tax law, have had more to say about what the tax rates should be, and what changes should be made in the administrative provisions, and what should be done to cleanse the Department of "graft and inefficiency," than have the taxpayers who are directly affected and vitally interested.

It would be natural to suppose that Congress would pay more attention to taxpayers than to non-taxpayers in relation to matters that pertain only to taxpayers. But is this supposition correct? When the Revenue Act of 1924 was first proposed, it carried certain provisions relating to reorganizations of corporations which involved retroactive features that were particularly drastic. In other words, taxpayers who had negotiated and closed certain corporate transactions under the 1921 law and prior laws, in accordance with rulings of the Department, were to be penalized by having such transactions retroactively declared illegal and additional tax liability thereby arbitrarily created. The representative of an organization whose membership is especially favored under the income tax laws appeared before the Ways and Means Committee and insisted that these reorganization provisions, with their drastic retroactive features, be enacted into law. From that time forth, protests of taxpayers were of no avail. Many other illustrations of like character could be given. In the instance cited, as well as in other instances, added complications were imposed upon the administrative machinery of the government.

The House Ways and Means Committee and the Senate Finance Committee could perform a service for themselves as well as for taxpayers if they would make it impossible for persons appearing at hearings to clutter and confuse the record with arguments, opinions and suggestions on matters in which these persons have no proper interest. In other words, these committees should hear representatives of each industry on matters pertaining to the particular industry they represent and concerning which they may be presumed to have reliable first-hand knowledge, but should not hear them on matters pertaining to another industry where their knowledge is limited and their opinions are based on hearsay. Non-taxpayers and their representatives who appear and want to be heard should be required to show that they are affected in some particular by the provisions of the bill they propose to discuss.

A SIMPLIFIED LAW NEEDED

A simpler tax law cannot be formulated and enacted unless taxpayers who pay the federal tax bill are given more consideration. Less than eight million persons are required to pay income taxes. More than twenty million persons pay no income tax and are not even required to file returns because of personal and other exemptions and deductions. If representatives of these twenty million are permitted to dictate provisions of the law, the rate schedules, and taxation policies, it will be impossible for Congress to alleviate existing administrative difficulties. know that the government must have adequate revenues and do not object to payment of amounts legally due; but they do object to the determination of tax liability by technical rules and methods that they do not understand.

The administration of the present system of income taxation is very costly. While the government appropriates less than \$50,000,000 annually to defray the expenses of its vast collection agency, it is costing taxpayers in excess of \$200,000,000 annually to comply with the revenue laws and secure an accurate adjudication of tax liability. More than 100,000 taxpayers are forced to come to Washington each year for conferences

on questions raised in the examination of their returns. Besides, compliance with all the intricate provisions of the law and the rules and regulations of the Department involves the loss of a great amount of time of busy executives and great annoyance and inconvenience to those whose repeated efforts to meet every requirement of the law seem to be fruitless.

If Congress will enact a common sense law which will enable the Department to render common sense decisions in the determination of the rights of taxpayers, much of this trouble will be eliminated and there will be fewer appealed cases

Congress should not ignore the advice and suggestion of tax payers in the enactment of revenue legislation, The Treasury Department should seek the advice and cooperation of tax payers in drafting rules and regulations for the determination of tax liability and for the collection of taxes.

for the new Board of Tax Appeals to adjudicate. If the law is examined for defects and intricacies that create controversies and litigation, and greater weight is given to suggestions of taxpayers as to how the law should be revised and conditions remedied, Congress should be able to give the country a better law. In all dealings with taxpayers both Congress and the Department will inspire better feeling all around by adopting a cooperative, rather than a sandbagging, plan of procedure.

· MINE DEPLETION ALLOWANCES

From time to time allegations have been made that the Department has granted improper depletion allowances to mines and oil wells. Those making the allegations, either purposely or through ignorance, entirely ignore the principle upon which the depletion deduction is based. This matter probably will be investigated by the Senate select committee. Mining taxpayers have no fear that "improprieties" will be found, and if the committee will realize that the principle of depletion is sound and just, no harm can possibly accrue to the mining industry from the investigation.

It should be unnecessary to point out that the depletion allowance granted in the case of natural resources—mines, oil and gas wells, and timber—is no different in principle from the depreciation allowance in the case of farm buildings and implements, factories, office buildings, railroads, automobiles, vessels, wharves, and other facilities that are subject to wear and tear, exhaustion, or obsolescence, except that in the case of depletion the wasting or exhaustion of the asset is caused by removal of its

units and therefore is more apparent. All taxpayers, including farmers, using depreciable assets in their business operations are entitled to an annual allowance as an element of expense that will be sufficient to afford replacement of their investments over the useful life of the property plus any salvage value remaining at the end of the period of usefulness.

THEORY OF DEPLETION

The theory of depletion has been stated by A. Lowes Dickinson, in his work on "Accounting, Practice and Procedure," as follows: "As a general principle, whatever there is in the ground, whether known or unknown, has been reduced during the period under consideration by whatever amount has been Wm. B. Gower, in the extracted." Journal of Accountancy, August, 1918, defines it in these words: "That gradual exhaustion of the ore body is an element of expense which should be taken up in each and every fiscal period during which minerals continue to be won from the mine, at a more or less constant rate per ton." H. L. Simcoe, formerly assistant head of the Natural Resources Division of the Revenue Bureau, in an address to members of the income tax unit, made it understandable to the most inexperienced layman, in the following language: "The mine operator who sells his metal or his coal is selling not only his product but at the same time a part of his mine; and the apparent income for a given year's operations is part profit and part return of capital. The gross receipts must cover both."

The mining industry has not been favored by the Department in the interpretation and application of the depletion provisions of the revenue laws. On the contrary, the Department has been severely rigid. The law grants a reasonable allowance for depletion and depreciation, "according to the peculiar conditions of each case." This language indicates that Congress intended there should be a certain flexibility in its application. Paul Armitage, chairman of the American Mining Congress General Tax Committee, in his address at the Milwaukee conference on mine taxation, 1923, described how the Department has applied the depletion section to mines. He said: "The capital sum (cost or value) is divided by the estimated tonnage or reserves, and the quotient, denominated the 'unit of depletion,' is used to multiply the yearly production or sales, to obtain the annual deduction for depletion. And this inflexible rule is applied to all cases alike, whether it insures the return of the capital sum or not."

DISCOVERY VALUE

The discovery clause of the depletion section also has been attacked, and its

administration by the Department criticized. The discovery clause was enacted for the purpose of encouraging the discovery of new ore deposits and new mineral reserves by recognizing that such discoveries brought into the commercial and economic world new wealth and new capital and raw material needed by civilization. The discovery clause, if properly interpreted, would have placed the discoverer of minerals, where discevery was made after March 1, 1913. on substantial equality with a discoverer who made discovery prior to March 1, 1913, for income taxation purposes. But when the question of discovery value bebbed up during the hearings before the Senate select committee, it was made the subject of severe comment on the part of one prominent Senator, who, in referring to the Department's method for computing depletion based on discovery value of oil wells, said: "I think that is the most ingenious scheme to rob the government." (See page 240, Part 2, Hearings under S. Res. 168.) The attitude of this Senator undoubtedly caused the defeat of an amendment to the tax law that was vitally needed by the western mining industry. This amendment, introduced by Senator Smoot of Utah, would have encouraged and protected new prospecting and development, and would have resulted eventually in more taxes to the government because of new mining operations and sources of taxable profits upon which to levy taxes.

In connection with this amendment, the attention of the Senate Finance Committee was called to the fact that less than a score of discoveries had been allowed metal mines by the Department during the ten years since 1913, and also to the fact that no coal mine has been allowed to set up discovery value for depletion purposes. Mr. Armitage, in his brief to the committee, said: "The Bureau of Internal Revenue has actually turned the discovery clause in many cases to the injury of the mining industry which it was designed to protect. It has ruled not only that new deposits in existing mines may not be added to the value for depletion but holds that such newly discovered ore deposits to the amount of the contained units must be used to diminish the depletion rate otherwise allowed to the taxpayer under the law."

The situation often has been misrepresented. A most notable instance of a misstatement of fact concerning depletion allowances will be found in a brief submitted to the United States Coal Commission by representatives of the United Mine Workers, who alleged that improper depletion allowances had been secured by the coal mining companies through revaluations, resulting from alleged discoveries of additional coal reserves, when, as a matter of fact, the

revaluations referred to did not increase the capital sum to be returned and in most cases actually caused a reduction in the annual rate of depletion per ton of coal mined. It is unwarranted attacks of this character—from such sources and by such methods—that furnish fictions upon which investigations are started, and that frequently obstruct progress toward simplification and betterment of the tax law.

FACTS NOT DETRIMENTAL

The Tax Division of the American Mining Congress has endeavored to extricate facts from the muddled situation, and to keep the facts constantly before Congress, the Department, and the public. The facts cannot be used to the detriment or injury of the mining industry. If Congress will weigh the facts and will consider the justice and equity of the mining sections of the revenue law, the mining industry will have no cause to fear that these sections will be modified along lines that would be injurious, any more than the farmer or manufacturer need have fear that his allowances for depreciation will be restricted or denied. The danger in the situation lies in the fact that each new Congress is made up of many new members from all parts of the country who may be misled by misinformation and propaganda concerning taxation matters, and who, although honestly and conscientiously trying to do the right thing, may actually become the prime movers in behalf of legislation that would be distinctly unfortunate and injurious. Therefore, it behooves taxpayers to keep their Representatives and Senators fully informed in relation to their problems and rights.

It is believed that the foregoing comments on the situation at Washington in relation to taxes, both in Congress and in the Department, will throw some light on underlying difficulties that can be overcome if Congress, the Department, and taxpayers will recognize good faith in each other and will work out solutions of their problems together. Congress should not ignore the advice and suggestions of taxpayers in the enactment of revenue legislation. The Treasury Department should seek the advice and cooperation of taxpayers in drafting rules and regulations for the determination of tax liability and the collection of taxes. Taxpayers should not permit misinformation to be broadcast without utilizing every available means for counteracting its ill effects. Taxpayers of the mining industry should be fully prepared to meet every attack upon their rights under the revenue laws during the sessions of the next Congress.

GRAPHITE IN 1923

THE graphite mining industry in the United States made considerable progress in 1923, according to a report prepared in the Department of the Interior by the United States Geological Survey, in cooperation with the geological surveys of Alabama, Michigan and New York. During the World War this industry flourished, for graphite is an essential war mineral, and large stocks of it, both domestic and foreign, were accumulated. Consequently in the years immediately after the war the industry languished. In 1923, however, there was an increase in the quantity sold and imported, as well as in value, the sales amounting to 4,056 tons of amorphous graphite and 3,964,900 pounds of crystalline graphite, compared with 2,200 tons of amorphous graphite and 1,849,766 pounds of crystalline graphite in 1922. The manufacture of artificial graphite at Niagara Falls, N. Y., reached the high mark of 26,761,015 pounds, more than twice the output there in 1922. quantity of graphite imported for consumption rose from 12,488 short tons in 1922 to 19,434 tons in 1923, an increase of 56 percent.

An attractive illustrated poster, the first of its kind ever issued by a government department, is being distributed by the Department of the Interior.

Designed at the special direction of Secretary Work as a primer to show the various services rendered the public by the Interior Department in such form that they are comprehensible at a glance, the poster is of a distinct educational value. It is printed in three colors.

At the top of the poster is a halftone photograph of the magnificent Interior Building at Washington. Below are abbreviated descriptions of each of the 14 bureaus of the department, headed by striking illustrations showing the principal functions performed by them.

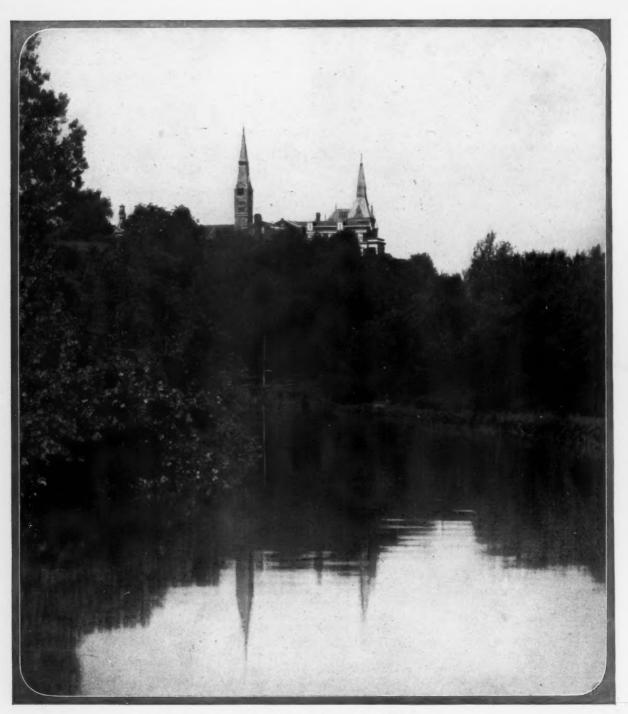
The date of the establishment of each bureau, a compilation of its activities, the number of its employes, the annual appropriations necessary to pay the cost of its operation, its receipts and other instructive information are contained in the poster. The bureaus included are the General Land Office, Bureau of Indian Affairs, Pension Office, Bureau of Education, Patent Office, Geological Survey, Bureau of Reclamation, Bureau of Mines, National Park Service, the Alaska Railroad, Howard University, Freedmen's Hospital, St. Elizabeth's Hospital, and the Territories.

An interesting feature of the issuing of the poster is the fact that it was not necessary to go outside of the department to have it made. Distribution of the poster is being made to a great many schools and other educational institutions throughout the country.

The Famous "C. & O." Canal

ROUND was broken for the creation of the famous old Chesapeake and Ohio Canal by John Quincy Adams, then President of the United States, July 4, 1828, the same day the ground was broken for the B. & O. Railroad by Chas. Carroll, of Carrollton. The work was completed in October. 1850. Since that time the canal has been used as a means of transporting coal from the Cumberland region to Washington. Even today the tow boats are seen in daily commerce between these two points, the barges being towed peacefully along by faithful mules.

The Canal is 186 miles in length, 60 feet wide at the surface and six feet deep. There are two very expensive aqueducts besides many culverts. The water supply is drawn from the Potomac by means of six dams with their feeders, while the difference in level between Georgetown and Cumberland is overcome by 81 locks.



Bend in the canal below Georgetown University, Washington, D. C.

September "Rush and reed, and thorn and vine, Clumped with grasses lithe and tall— With the web of summer-shine Woven round it all."

BITUMINOUS COAL AND AMERICAN INDUSTRY

Comparison Of Amount Paid For Coal By Railroads And Profits Accruing To Roads Through Transportation Of Coal—Cost Of Fuel And Power Versus Manufactured Product Shown—No Monopoly in Coal Industry—Division Of Technical Research To Be Organized—Startling Comparisons And Statistics Given.

Government Interference and Regulation Condemned

tical way of measuring th

T HAS been frequently stated that the rapid advance of the United States to the position of leadership among the industrial nations of the world has been made possible by its practically limitless supply of coal at low price. It may be doubted, however, whether many people realize either how astounding the industrial growth of the country has been or how closely it has been tied up with the expansion of the bituminous coal mining industry.

In the year 1849 the value of the products of manufacturing industries in the United States, including so-called hand and neighborhood industries, was a trifle over one billion dollars. In the year 1919 the value of the products of manufacturing establishments, excluding hand and neighborhood industries, was \$62,418,000,000, slightly more than 62 times the value of the entire output in 1849.

During the decade ending with 1849 the average annual production of bituminous coal in the United States amounted to 1,660,000 net tons. The average annual production during the decade ending with 1919 was 471,644,000 tons; that is the production was 284 times as great during the latter decade as during the earlier period.

Unfortunately we have no statistical record of the importance of railroad transportation in 1849, and no means of measuring its growth from that period to the present time. Such figures are available only for the current century. During the fiscal year ending June 30, 1900, the total net tons of revenue freight originating on all steam roads in the United States amounted to 583,351,000. During the calendar year 1919 the amount of such freight was 1,189,765,000 net tons. This showed an increase during the twenty years of 104 percent.

During the same twenty years the value of the products of the manufactures of the country increased from \$11,407,000,000 to \$62,418,000,000, or nearly 450 percent, and the average yearly output of bituminous coal from 130,356,000 tons to 471,644,000 tons, or slightly over 260 percent. A part of the increase in the value of manufactured products has been due to the advance in prices that has taken place during recent years. Unfortunately there is no prac-

tical way of measuring the physical volume of the output of manufactures.

By HARRY L. GANDY *

A study of the detailed figures from decade to decade brings out very forcibly the fact that a constantly increasing output of fuel at low price has been as much the cause as the effect of the



Harry L. Gandy

growth of the manufacturing and transportation industries of the country.

The cost of bituminous coal constitutes a small proportion of the total expenses of the railroads, of the value of the finished products in manufacturing industries and of either expense or the value of the product in mining and quarrying enterprises.

Approximately 28 percent of the production of bituminous coal is purchased by the railroads, which are the largest users of that commodity. In 1923 they paid in excess of \$519,000,000 for their bituminous coal supply, which represented 84 percent of their total expenditures for fuel. It is well to consider just how great a burden that was to them. Their expenditures for all kinds of fuel represented but 12½ percent of the total operating expense and 9.7 percent of the total operating revenue. Purchases of

bituminous coal represented 10½ percent of the total operating expense and 8.2 percent of the total operating revenue. Thus, if the bituminous coal used by the railroads of the United States during the year 1923 had been furnished free, the total operating expense would have been reduced by only 10½ percent. The saving would have been considerably less than a mill per ton mile on all revenue freight and passengers transported.

The fuel purchased by the railroads enabled them to move the commerce of the land. While the railroads paid \$519,007,000 for bituminous coal in 1923, they received for the transportation of bituminous coal for others \$856,242,000, or, in other words, this commodity alone furnished \$337,235,000 more in freight revenue than was paid for all bituminous coal, and \$238,435,000 more than the cost of all their fuel and power requirements. The revenue received from the transportation of bituminous coal represented 181/2 percent of the total freight revenue of the railroads, and more than double the amount paid by any other single commodity. Bituminous, anthracite and coke furnished one-fourth of the railroad freight revenue of 1923.

After all the recent talk about the high cost of coal, the latest available information of the Bureau of the Census is very instructive on the relationship that the cost of fuel and power bears to the value of the products of various lines of manufacturing industry. The highest percentage is in iron and steel blast furnaces, where 29.7 percent of the value of the finished product is represented by the cost of fuel and power. That percentage is less than 1 percent in the automobile industry, including bodies and parts; in bread and other bakery products it is 1.7 percent; in cotton goods it is 1.7 percent; in electrical machinery appliances and supplies it is 1.4 percent; foundry and machine shop products show 1.6 percent; steel works and rolling mills, 5.5 percent; leather, tanned, curried and finished, 1.1 percent; paper and wood pulp, 7 percent; rubber tires, tubes and rubber goods, 1.3 percent; smelting and refining of copper, 3 percent; sugar refining, not including beet sugar, 1.3 percent; woolens and worsteds, 1.2 percent; in other manufacturing industries the low percentage is just as striking. According to the

^{*}Executive Secretary-National Coal Associa-

1919 census of manufactures, from will continue to be made. Certainly which the above percentages are computed, the value of the finished products of reporting manufacturing industries in that year was \$62,418,079,000, while the total cost of all fuel and power was \$1,645,987,000; and the latter figure included the cost of transportation of fuel, and, where power was purchased, rates high enough to cover the item of depreciation of plants. Even so, the total cost of fuel and of power for all reported manufacturing enterprises, according to the census, was only 2.6 percent of the value of the finished product. Thus it is seen what a small average reduction would be made possible if fuel and power were furnished free to these manufacturing industries.

In the mining and quarrying enterprises listed in the Census of Mines and Quarries for 1919 the same relationship is brought out. Figures are not given from which the cost of bituminous coal can be segregated from the cost of other fuels; but the total cost of all fuels, of which bituminous coal constitutes a much smaller part than it does in manufacturing industries, is only 2.9 percent of the value of the products.

Because the production of the important kinds of fuel, namely: anthracite coal, bituminous coal, fuel oil and natural gas, are all included in the Census of Mines and Quarries, it is interesting to note what a large part of each of those kinds of fuel is consumed by the establishments by which they are produced. Thus of the entire consumption of 16,275,751 tons of bituminous coal 68 percent was consumed by bituminous coal mining enterprises; of the 8.697.000 tons of anthracite, 98 percent was consumed at the anthracite mines while 62 percent of the total consumption of fuel oil by mines and quarries and 97 percent of the consumption of natural gas, was credited to the industries producing those respective fuels.

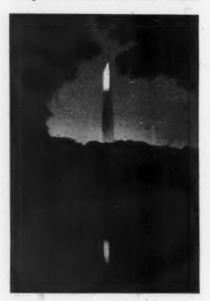
The great industrial system of this country rests upon a continuous supply of fuel. Fortunately nature dealt bountifully with the United States in placing therein approximately one-third of the world's supply of coal. Deposits of coal are located in at least thirty states. The thickness of the coal seams and the mining conditions vary in different sections, as does also the quality of coal. Computations made by the United States Geological Survey place the tonnage of the known deposits in excess of 3,500 billion tons of coal. The estimates of coal heretofore mined in this country vary from one-half of one percent to 4 percent. Thus, it is apparent that we have available a coal supply that will last some thousands of years. Invention will not cease with the present generation, and improvements in combustion processes and transmission of energy

there is no justification for any fear of shortage in the natural endowment of this heat-producing substance.

Statistics tell us that with the possible exception of a part of one year. and notwithstanding the higher wages paid in this country, the operators have, for a great many years, sold bituminous coal at the mines for a price less than that enjoyed by any other coal-consuming public in the world. Newer mines, more improved mining methods and the development of thicker seams have made that possible. Coal is regularly exported to other less favored lands.

The average production of bituminous coal in this country is approximately 500,000,000 tons per annum, and engaged in the production thereof are about 9,000 operating concerns, not one of which produces more than 31/2 percent of the total output. In fact on two hands can be counted the number of operating companies each of whom produce so much as one percent of the yearly output. The average annual production per operating concern is less than 60,000 tons. The United States Coal Commission definitely stated, after full and complete investigation, that there is no evidence of any combination or monopoly of bituminous coal operators now or at any time, either to influence prices or to control production. Among the thousands of operators the keenest of competition prevails. Because they are widely scattered and owing to the vast undeveloped coal deposits, it has been said that nature herself enforces the Sherman Anti-Trust act in the bituminous coal industry.

There never has been any shortage of coal, although at times either labor or transportation difficulties have affected



The Washington Monument

the supply of mined coal at points of consumption. Unusually large purchases of equipment by the railroads during the last year or two have placed them in position to handle the fuel needs of the country. This was proven beyond a doubt by the record of their performance in 1923 and the first quarter of 1924. The best thought of the operators is being given to a continuance of the amicable labor relations now generally existing. It is the intention of the industry to furnish a continuous supply of bituminous coal.

Along with the growing activities of the Federal Government in the realm of trade and of industry there have been suggestions looking toward governmental regulation of the bituminous coal industry. This action could not be urged on the ground of monopoly, for the United States Coal Commission held that no monopoly exists. It is not needed for conservation of a failing supply, for, as has been herein stated, the bituminous coal deposits of this country will last some thousands of years. When it is considered that the operators have consistently furnished coal to the consuming public cheaper than the operators of any other country, it is seen that such a movement is not necessary to protect the consumers from high prices at the mines. Governmental interference could only add increased burdens which would be reflected in the cost of coal to the consumers.

The bituminous coal mining industry has its local district operators' associations and on a national scale the National Coal Association, which strive through cooperative effort to promote the welfare of the industry and increase the value of its service to the public. In the fields of traffic and statistics the National Coal Association is well equipped to assist in the advancement of the industry. Plans, are already under way for a division of technical research, which will be a clearing house of information with respect to more efficient methods of consuming bituminous coal, and later on may make its own contributions through independent technical investigations.

The bituminous coal industry has had more than its share of misrepresentation and of unwarranted criticism. On numerous occasions in the past the National Coal Association has argued the case of the bituminous industry before the government and the public. It will be one of its main purposes in the future as it has been in the past to defend the industry against such unwarranted attacks and to present it in its true light as an industry rendering an indispensable service to the public and receiving for that service an inadequate rather than an excessive compensation,

AN ACCOUNTANT'S REVIEW OF COAL

It Is Not Overcapitalized Or Overdeveloped—The Days Of Arbitrary Selling Prices
Are Gone—Success Depends On Management And Merchandising

TRIPPED of all buncombe and fol de rol, the coal industry is a business enterprise. It exists to make money. It is not worth entering or staying in if there is no chance for profit. No man will invest his money in it or put his energy into its management solely for the altruistic purpose of giving employment to the fathers of other people's children or of supplying power to other people's factories and heat to other people's homes. Those things are interesting by-products of the coal industry. The doing of them gives to any man a degree of pride and satisfaction in his undertaking, but they are not the incentive; they are pure by-products of the "main chance." They, in no sense, are the true inspiration for the business or the sole reason for anybody's continuance in it.

If we are to understand coal today, we must without self-deception—much less any attempt to deceive others—appraise the coal industry as an accountant would do if he were assigned to the task by a banking house which cold-bloodedly wanted to measure the chances of success if it should finance a coal enterprise. The effort herein is to appraise the coal industry on that severe basis.

In doing so, the first piece of fiction which has to be destroyed is the assumption, often glibly expressed that anthracite and bituminous are really separate industries and should be considered economically and financially as being on a different basis. On the contrary, they are competitive at all points and by every economic and social tie are parts of the same industry; both rise or fall on any considerations that vitally concerns either. They, therefore, are to be treated as integral parts of the same industry.

The first thing that the banker wants to know—because that is what his customers want to know—is whether the coal industry is overcapitalized. That is, is it overcapitalized when the size and asset value of the plant is taken into account?

Considering all the coal under the ground as being available for production, the coal industry has segregated a little patch—not to exceed 1 percent of the total—which it has set aside for immediate development. It is this small patch which is herein considered to be the coal industry. Into that land mines have been sunk. Around those mines plants have been built. A very modest asset value of that patch of land, of those mines and of those plants has been de-

By GEORGE H. CUSHING

clared to be approximately 12 billion dollars. This figure merely expresses the value today of the land and the mining plants. It leaves out of consideration the value of the plants employed for distribution and merchandising.

The same sort of cautious appraisal shows that the total amount of capital



Geo. H. Cushing

invested in this patch of land and these plants is slightly under four billion dollars.

Therefore, we have an asset value of the plants of 12 billion and a capital of four billion, or about one dollar of capital for three dollars of asset value. On that basis, the coal industry surely is not overcapitalized. As a matter of fact, it has a loan value in the discount market which is practically twice its present total capitalization. Its financial position, therefore, is unusually sound.

The second question which the banker wants to know is whether the patch of land segregated for immediate development is too large and whether there are too many plants developed on that patch of land, the normal expectancy of the trade being considered.

Such a question cannot, of course, be answered with that precision which the rules of accurate accountancy demand, Still it can be answered on that actuarial basis which has been found accurate in life insurance and in practically every other industry. If you accept as "normal" the average annual production for the five years ending in 1913 and if you

increase that by so little as 4 1/6 percent a year, the demand for bituminous coal alone in the United States in 1925 should be 635,000,000 tons at least. In addition there should be a demand for at least 90,000,000 tons of anthracite, making a total demand for 725,000,000 tons of coal.

The assumption in these figures is entirely reasonable because the 4 1/6 percent increase per year was arrived at by figuring the rate at which, prior to 1913, the tonnage had grown in period of depression over the tonnage of the immediately preceding period of boom. If the coal tonnage increased in the five-year period of depression an average of 4 1/6 percent per year over the preceding period of boom, obviously it is not extraordinary to expect that same rate of growth in the period when business is normal.

Taking into account the actual performance of the industry, the largest production of bituminous we have ever been able to sustain has been a trifle over 11,000,000 tons a week, or at the rate of about 575,000,000 tons a year. The largest anthracite production we have been able to sustain has been about 90,000,000 tons a year. This yields a total of about 665,000,000 tons.

Therefore, the largest performance by the industry has fallen about 60,000,000 tons a year below what is next year's "expectancy" of coal consumption. On that basis the coal industry most assuredly is not overdeveloped.

Of course, there does not exist today a demand for anything like 725,000,000 tons of coal. That in itself is an abnormal condition. But it indicates that rather than the coal industry being overdeveloped the whole nation is moving under some kind of an economic handicap. But, if the nation were not bound temporarily by these hidden and restricting conditions, the present coal plant would be inadequate rather than excessive.

The next question which the banker and his clients want answered is: Can a price be obtained for the coal which will yield a profit to the operator?

There is a line—not yet defined—beyond which the selling price of coal may not go. Coal has no monopoly. It can have no monopoly because other sources of heat and power are available and will be employed if the price of coal shall at any time become unreasonable.

With the maximum—but so far unknown—selling price thus fixed, the coal industry is struggling against a wage schedule and a transportation charge against which the people rebel. The result is that the operator must forego a profit in order to pay the excessive wages and rates of carriage. However, these are temporary influences which can and will be removed because so great an industry cannot be allowed to perish. At the minute, however, they are serious handicaps to the prosperity, if not the solvency even of the most prudent managers in the industry.

The next question which the banker and his clients want answered is: What rate of return may be expected on money legitimately invested in the coal industry?

While the nation was engaged in foreign war, the demand for coal was excessive, and it was practically impossible to get the machinery, the workers or the transportation to develop new mines. It was even practically impossible to get to market the coal which might have been produced by old mines. At that time prices were naturally high as the result of the uneasiness of the consumers. Those prices passed, naturally, with the removal of the difficulty to get machinery, men or transportation. The prices today are indicated by different conditions. Any occurrence or device which would now raise prices to the point where the industry would be uniformly profitable would but serve to invite the opening of a large part of the unused acreage. That in itself would quickly transfer a uniformly profitable industry into one where losses were uniform.

Also, if the industry were uniformly profitable, prices must be uniformly high. Such a condition would serve to attract increasing attention to the substitute sources of heat and power and to encourage the development of substitutes for coal.

To avoid both of these extremes, the prices charged for coal must continue to be below that level which would make the industry uniformly profitable. And, that being true, commercial and financial success can come only to the best manager of coal mining companies.

The conclusion is inevitable that the day has passed when the commodity itself will sell at a profitable price. Therefore, anyone who would get a profit must obtain it by the skillful management of the property under his care. Success, then, is a matter of management and not of mere participation in the coal business. This rule is universal in industry, and, on that account, coal is no exception.

Making a hurried recapitalization: Coal is not overcapitalized. And, in consequence, its financial position is sound.

Coal is not overdeveloped, if the nation's business is on a healthy basis.

With the maximum price which the

consumers will pay practically fixed, those who would produce coal at a profit must curtail the labor cost of production and the cost of transportation,

To avoid successful competition by new coal fields or by competing fuels, the average selling price must be kept below that which will make the industry uniformly profitable.

To make a corporation successful when the industry itself is not uniformly profitable requires the best of management.

The conclusion at which such a study arrives is: The industry itself is not organically diseased and for success requires only capable management and improved merchandising.

ANTHRACITE ECONOMY SERVICE ORGANIZED

Program Of Education Outlined—Permanent Service Stations Created—Travelling Exhibit To Show In Twenty Cities

THE anthracite operators have planned a program of public education on the economy and usefulness of anthracite of far-reaching importance. It will consist of four permanent service stations, one each in New York, Philadelphia, Boston and Washington, where, for the first time in the history of the industry, coal consumers may go for definite information on the proper methods of heating a home. These permanent clearing houses of information will be known as anthracite economy service, with every indication that "service" will be rendered with unusual completeness.

A second step in the operators' campaign of public enlightenment will be a traveling exhibit, known as the anthracite economy service exhibit, with the same broad purpose as its keynote. It will be shown in twenty different cities, a week in each, starting at Portland, Me., the first week in September.

The anthracite economy service will build upon and extend the scope of past efforts to educate the public also in the wider use of smaller sizes, particularly buckwheat. A convincing into-the-home message will be carried to every part of the anthracite-consuming territory, special attention being given to encourage the housewife to visit the service and service exhibits.

Dealers who felt the favorable reaction from last year's educational drive and who were benefited by the cooperation given by the anthracite operators' association are particularly pleased by the announcement that the work this season will be started in August so as to get the full benefit of cumulative efforts, and it will be carried through the entire winter with energy. Both dealers and appliance manufacturers have agreed to cooperate.

The first step will be the opening of the four permanent information bureaus, each one showing complete installations of standard devices for the use of buckwheat coal. The personnel of the demonstrating force retained by the operators is the highest; men equipped by experience and training to prove the economy and efficiency of both the coal and the appliances will be in constant attendance.

The unique traveling exhibit, like the permanent service stations, will be given plenty of publicity, and with the dealers coordinating it should make a direct appeal to the great body of consumers. As in the case of the permanent service, considerable effort will be spent in showing the home owner and the housewife how to get a maximum of heat in the furnace or the boiler. This will apply particularly to buckwheat, although the broad idea is to show the public how to use anthracite coal to the best advantage. The extension of the use of buckwheat coal in the small home, however, is the objective directly aimed at.

All of the approved equipment designed for the average dwelling will be shown at all the exhibits. It will include the very newest device, a moderately priced compact and most efficient unit, including a special grate, blower and automatic control for burning buckwheat in the smaller size home. Friends of this new device for attaching to the average heater seem to believe that it will play a large part in promoting the sales of small size anthracite coal.

Nothing will be sold at either the permanent anthracite economy service exhibits, their purpose being purely educational. The service will be free to the public. Every effort will be made to get consumers of coal to visit these services, with the understanding that they will get the best available information about home heating, either from their present equipment, or new equipment if they are planning to build a home or change their old installations.

The 48 states of this country, the 3,000 counties and 13,000 municipalities with a total of more than 16,000 units of government, employ 3,000,000 men and women, at a cost to the taxpayers of \$4,500,000,000 a year. The 544,671 men and women employed by the National Government receive salaries of \$375,000,000 a year.

STANDARDIZED ACCOUNTING FOR METAL MINES

Standardized Methods Of Mine Accounting Held Vital To Economical Management—Essential To Terminate Existing Confusion And To Facilitate Tax Adjustments—Owner And Investor Alike Benefited—Shattuck-Arizona Copper Mining Company's System A Model

By H. H. MILLER*

MONG the many subjects investigated and reported upon by special committees of the Standardization Division of the American Mining Congress, not the least important has been that relating to accounting for metal mines, with the object in view of devising a system that will be standard for all metal mines.

Many persons have inquired, "Why a standard system of accounting for the mining industry, when scarcely any two mines, even in the same district, have the same characteristics, and most of them require different methods of ore treatment, at least in some respects?"

To answer this question, it would seem pertinent to look at the subject from the standpoint of the owner; i. e., the investor in the securities of the enterprise; of the manager, or operating executive; of the employes, or labor; and finally from that of the public at large, as represented by the various local, state and national taxing bodies.

The first successful effort towards uniformity or standardization of accounts for any class of industrial enterprises was inaugurated by the Interstate Commerce Commission when it promulgated its uniform system of accounts for the steam railways of the country, which system has since been adopted, together with changes and modifications which have from time to time been made thereto, by all of the state regulatory bodies having jurisdiction over the rail carriers. As a natural outgrowth of the plainly evident benefits of this uniformity of accounting for railways, standardized accounts have been prescribed for use by various classes of public utility corporations by the different commissions, etc., having jurisdiction over such utilities, not only with the consent of the utility corporations but with the hearty cooperation of their chief executives, who have realized the benefits of such standard accounts and have gladly given of their time, their services and their experience in helping to formulate the accounting systems as finally adopted and put into use.

What advantage, if any, has the owner or investor derived from this standardization of the accounts of the public utility corporations? To any of you readers ,who note in the financial columns of the daily press the frequently published monthly statements of the individual railroads of the country, the

figures therein stated of "net operating income" mean the same thing, whether published by the B. & O. or the Union Pacific systems, and not one thing for the former road and an entirely different thing for the latter road. also know that this item, "net operating income," means the same thing for January, 1924, as it does for December, 1921. Because of this uniformity, or standardization, of the accounts the owner of stock in two or more railroad systems is able, by studying the detailed reports of each, to determine which of his securities may be the more valuable and, to a limited extent, which of the enterprises is the more economically

Somewhat of the preference of certain classes of large investors for the securities of public utility corporations is due to the confidence they have in their regularly published reports, made up to conform to the standards prescribed for that class of utility.

If the standardization of accounts of public utility corporations has met with such favor on the part of the investing public, the owners of these enterprises, and it has resulted, as it surely has, in a more stable market for and a wider diffusion of their securities, would not

Long's Peak, Rocky Mountain National Park

the same benefits be reflected, even though to a more limited extent, in the market for the securities of the metal mines of the country?

It is true that there is a fundamental difference between a metal mine and a railway, for instance, since the former is a wasting asset, whose ore bodies when once extracted can never be replaced, while the latter, if properly located with respect to traffic conditions and density of population served, should grow more valuable year by year. It is not contended, however, that a system of accounts, devised for a railway corporation, should or could be applied to a metal mining corporation; only that a system in use by the Shattuck-Arizona Copper Company, for instance, if standardized should, as nearly as possible, be commonly used by all the other copper mining corporations, as well as by all the lead producers, the zinc producers, etc., with such modifications in minor particulars as may be needed to fit some condition peculiar to each individual property or corporation.

Each investor in the stock or bonds of any mining corporation should know that "net income" means the same when shown on the report of the Shattuck-Arizona Company as it does on the statement of the Hercules Mining Company, and not one thing in the former case and an entirely different thing in the latter case. He should also be advised if dividends declared and paid are all subject to federal income taxes, or if these so-called dividends include return of capital in form of distributions from depreciation and depletion reserves, which may or may not be taxable in the hands of the recipient, dependent upon the particular circumstances of each individual stockholder.

The writer is familiar with the practices of several different mining corporations, some of whom declare and pay dividends from true earnings, after making allowances for depletion and depreciation; others, while making distributions from both surplus earnings and from reserves, always advise the stockholder of the proportion thereof which is from earnings and that from reserves, and still others that make distributions, called "dividends," undoubtedly including distributions from reserves without any designation as to the source thereof but which the stockholder assumes, and is probably unconsciously led to believe, is paid entirely from earnings and, con-

^{*}Hercules Mining Company.

sequently, is subject in its entirety to federal and state income tax.

The above examples of actual practice on the part of different mining corporations are only a few, though very important, difficulties experienced by investors in attempting to analyze published statements of mining corporations. The same disparity is observable in the published balance sheet accounts of different mining corporations, and even persons familiar with a property and its past history often have difficulty in appraising the value of its stock from the published statements.

Were all the accounts, those set up on the balance sheet, those included in the income and expense accounts, etc., compiled and published on the same basis, using the same terminology, by the various mining companies, this confusion on the part of the owner, the investor, would soon give way to a clearer understanding of what is intended to be shown by the various classes of accounts.

The chief advantages to the operating executives of a standard or uniform system of accounting would be, first, in the ability to determine from an analysis of the accounts of other corporations, when compared with a like analysis of the accounts of their own organization, wherein possible economies could be effected in their own operation; and, secondly, an operating official, transferring from one employment to another, would not be under the necessity of having to learn an entirely new system, wherein the data pertaining particularly to operating costs is compiled on an entirely different basis to that with which he has been familiar during his former employment.

Many labor difficulties may be traced directly to ignorance on the part of the employes as to the actual earnings and financial conditions of the corporation with which they are employed. The rank and file of the employes usually are filled up with exaggerated statements of the immense earnings of some of the mining corporations, most generally by the professional labor agitator, as also with stories of the immense wealth controlled by the companies. Too often this ignorance as to actual conditions is due, in a great measure, to the fact that there is not sufficient publicity given to the actual condition of affairs by the corporations themselves. Frequently published statements by all the mining companies, prepared in a standardized manner in such a way as to be readily and easily understood by anyone of average intelligence, would at least help in overcoming some of the envy, jealousy and hatred among certain classes or types of employes and labor agitators.

A favorite pastime with certain politicians in the so-called mining states is their endeavor to ride into public office by promising to shift the tax burden off the backs of all other taxpayers onto the backs of the "rich mining companies," who, they say, are paying far less than their just portion of the public burden. It may be that in some instances those statements have some foundation in fact, yet there is no doubt, on the other hand, that exactly the reverse is true, and that the metal mining industry, in some localities at least, carries the major portion of the tax burden in that particular district.

Were uniform methods used in reporting results of mining operations and in stating financial conditions of the corporations, these exaggerated statements could readily be shown to be without foundation and a more equitable distribution of the tax burden could be arrived at by comparing the valuations of the holdings of the mining companies with other taxable properties of different character.

Perhaps the greatest benefits, both to the industry and the public official, to be derived from a standardization of accounting methods and practices, would be demonstrated in the dealings with the Income Tax Unit and the Capital Stock Tax Division of the Federal Internal Revenue Bureau. There is no doubt that banks and public utility corporations experience less difficulty in securing early audit and settlement of their tax liability with the Federal Government than almost any other class of corporations, due in a large measure to the standard methods of compiling and recording items of income, deductions and other things pertaining to the final determination of taxable income. It is also probably true that the determination of taxable net income is more difficult of ascertainment in the case of metal mines than in any other class of industry, since no other business presents so many complex problems, bearing upon the correct determination of allowable deductions especially, as does this one.

The revenue act of 1918 and the acts of subsequent years permit deductions for depletion of ore bodies based on March 1, 1913, values, in the case of mines owned or acquired prior to that date. Since many mines were discovered and profitably operated prior to March 1, 1913, the correct determination of their taxable net income for 1918 and subsequent years is dependent upon a correct determination of the March 1. 1913, value of the ore bodies, together with the metal content of those same ore bodies. Anyone who has had any experience in attempting to settle their tax liabilities with the department at Washington can testify to the delays and difficulties encountered, both by the representative of the taxpayer and by the employes of the department, in arriving at a fair value for the ore bodies and the annual rate of depletion, in the case, particularly, of those mines which were in operation prior to March 1, 1913, due largely to the lack of detailed and reliable data respecting cost of acquisition and development and of operating costs. The same difficulties, only to a greater extent, were encountered in arriving at an equitable value for invested capital under the excess profits and war profits taxes provisions of the 1917 and other laws. All of these problems could have been greatly simplified had the mining corporations kept accurate, standardized accounts in those early years of their existence.

From the foregoing it is seen that many advantages would accrue to the industry and to the public from the adoption of a standard, or uniform, system of accounting for metal mines, and it is hoped that the committee in charge of the preparation of such a system will continue the work and submit its conclusions for adoption by the corporations engaged in this line of industry.

To realize the fullest measure of benefits, it is not alone necessary that any system be adopted but that in addition thereto frequent and continued publicity become the policy of the individual units of the industry, to the end that the owners of the properties may at all times be fully advised of the status of their investments and that the exaggerated and ofttimes false and malicious statements of the labor agitator and the political demagogue may thereby be refuted.

MICA IN 1923

THE mica industry in 1923 showed an increase in the quantity and value of both sheet and scrap mica sold during the year, according to the Geological Survey. A total of 9,086 short tons, valued at \$440,875, was sold.

The sales were made in 11 states—North Carolina, New Hampshire, New Mexico, Virginia, South Dakota, Georgia, Wyoming, Colorado, Connecticut, South Carolina and New York, named in order of total value of mica sold from greatest to least.

The prices during 1923 on the whole showed small variation. The prices of the smaller sizes of sheet mica decreased toward the last half of the year, and the prices of the sizes larger than 2 by 2 inches showed varying increases for the same period. The prices of uncut sheet mica for the first half of 1924 were slightly higher than for the preceding six months and were more stable.

The total value of mica imported for consumption in 1923 (including cut mica) was nearly twice that for the previous year, being \$2,404,848 as against \$1,330,622 in 1922.

STANDARDIZATION IN MINING

Lack Adoption Of Standards Shortsighted Policy—High Operating Costs A Penalty—Opportunities For Real Saving Outlined—Systematic Development Necessary—"Pirating" High Grade Ores Condemned—Universal Adoption Of Contract Or Bonus System Urged

By Chas. A. MITKE*

HERE is a present lack of appreciation of the benefits which may accrue from the application of standardization to mining.

During the past three years the tendency to take a somewhat shortsighted view of conditions has largely influenced a number of organizations to center all efforts on production, and postpone many vital necessities which inevitably enter into the present cost per pound, and future cost of production. This nearsighted view, which might be expressed as "seeing things from within the forest," developed quite naturally as a result of the year's shutdown in 1920-21, followed by the depression, the length of which no one at the time could foresee, and which was variously predicted would last anywhere from a few months to a few years. This uncertainty resulted in the adoption of a day-to-day policy in many camps, ore extraction taking preference, while important repairs and necessary development work were deferred until the termination of the depression, which it was hoped would soon be over. As a consequence, many stopes were overmanned, creating the usual overproduction conditions, . while prospecting and development work were generally undermanned, thus accounting in part measure for the high cost per pound.

Such a policy might not have been so serious had the depression merely lasted a few weeks, or months, but as the weeks grew into months, and the months into years, it had a marked effect upon the life of the mines generally, as well as upon the cost of production.

As a result, we find today that instead of shafts being sunk far in advance of level development, levels and stopes in many instances are deeper than main shafts, which involves double handling of all ore and supplies, and carries with it a high cost penalty. Instead of ore bodies being properly developed before regular mining operations commence, frequently the stoping has been started prematurely, and it soon appears that the insufficient development work is not suitable and an expensive change of plans becomes necessary.

Instead of ventilation keeping pace with the stoping and expanding with the progress of mining, frequently the same poor conditions which existed ten years ago, are found today. Without

good air no man can live, much less work, and upon the condition of the working place depends very largely the efficiency of the worker. Today such conditions are unnecessary, and the adoption of standard equipment and standard methods will provide the men with a working atmosphere in which they can put forth their best efforts without discomfort to themselves.

Instead of bonus or contract systems being universally adopted, the day's pay system still prevails at many mines, whereby a man is paid his daily wage for working a certain number of hours, regardless of output.

Instead of timbering in working and haulage drifts being kept in repair for efficient work, frequently one finds timber broken in far enough to obstruct the passage of cars.

Good tracks, which are essential to first-class haulage are often found to be uneven, partly under water, and cars readily leave the track, especially at curves, frogs and switches. This is largely due to ditches not being cleaned regularly, which soon allows the water to rise, flood the tracks, and soften the roadbed, thus offering unusual difficulties to employes walking through, as well as interfering with transportation.

These defects are only a few of the many examples which make their appearance during times of low metal prices, when unusual "so-called" economies are practiced in the belief that the depression will be short and when it terminates everything can then be caught up and put in workable shape.

While the above conditions may not all be found in any one mine, they are individually noticeable in a number of properties, evidencing a general trend towards inefficiency.

It is quite possible to adapt the mining industry to meet the ever changing conditions of a metal market, ranging from small to large consumption, by switching men from production to development work, and vice versa. Usually about 50 percent of the men underground are on production, while the remaining 50 percent are employed in development work, repairs, transportation, engineering, etc. Therefore, approximately 50 percent of the total number produce 100 percent of the metal. When the price of the metal

drops, if 5 percent of the total men in the mine were transferred from production to development, this would reduce production by 10 percent and allow a little extra development work to be prosecuted. Frequently, when curtailments are necessary, it is the force on development work that is cut down, rather than the 50 percent on production. The 50 percent of the men on production are erroneously termed "producers," while the 50 percent on development are often referred to as "nonproducers," "necessary evils," etc. As a matter of fact these terms are entirely incorrect, as it is the second 50 percent (men on development, repairs, transportation, etc.) which makes it possible for the first 50 percent (the men in stopes) to produce ore.

Before ore can be mined it is usually necessary, first, to find it by means of systematic development work, then block it out efficiently, so that the ultimate cost per pound will come well within the limits of an economic enterprise. If this part of the work is consistently neglected it cannot fail but have a detrimental effect upon the life of a mine.

Too often in critical times—such as during the recent war when every effort was strained toward production, and later, during the period of depression, when the low price of metal made it difficult to produce at a profit—high grade ore is extracted at the sacrifice of average and medium grades, which, under ordinary conditions would prove commercial. As one writer expresses it:

"During the last several years many copper mining companies, to keep in the business and try to operate at the current prices for this output, have been taking the cream of their mines, permitting lower grades to remain in the mine. This is always a questionable practice and no keen operator would indulge in it. Too often, the ores left cannot be later recovered, due to bad ground. It is the average of the ore deposit that counts, and when one robs the mine of its cream and leaves the skim milk he is jeopardizing the future of the property. * * * It is like the case of the fellow who strives for a record by taking the rich portions of the ore deposit, and who, if he gains his point, does the property great damage." †

The time has come for the practice of systematic development work, the min-

^{*} Consulting Engr.: Chairman, Metal Mining Branch, Standardization Division, American Mining Congress.

^{† &}quot;Pirating the Copper Mines," Iron Ore.

ing of average grade ores, the protection of lower grades during times of depresion, and their conservation until the recovery of the market, when they may again become commercial, rather than neglect and cave them by cheapermethods used in "pirating" the high grade.

A brighter outlook for the metals appears on the horizon, which calls for a new point of view, as contrasted with that held during the last few years. The time has now arrived to come from "within the forest" and view the mining industry from the outside, and carefully weigh and study the needs of the present day.

Instead of the old day-to-day idea, which has prevailed for a long time in many places, let us take a long distance view of the mining business, keeping in mind the great possibilities of the future.

The adoption of a farsighted policy, which would provide for mining of average grade ores; the preservation of the lower grades, which frequently surround the high grade, to be extracted whenever the market warrants; a systematic program of continuous development work; the switching of men from production to development whenever the price of the metal drops to a figure where the margin of profit is too small; the standardization of operations wherever good can be accomplished; the obtaining of the highest efficiency of the working force by improving conditions so that the men can do a fair day's work: the installation of equipment that will tend to lower production costs; the careful attention to necessary repairs; and the universal adoption of satisfactory contract or bonus systems cannot help but have a very beneficial effect upon the future of the mining industry.

SAFETY LAMPS

THE flame safety lamp is being rapidly replaced by the electric lamp as a device for illuminating the miner's working place. In the United States the electric cap lamp has been widely adopted, it being estimated that there are at present about 200,000 of this type of lamp in use. In 1911 approximately 45,000 flame lamps and no electric lamps were being used in the Pennsylvania bituminous mines which were then producing 35 percent of all the soft coal mined in this country; by 1918 the flame lamps had decreased to 17,000, whereas electric lamps totaled nearly 48,000. In Great Britain during the same years the total of 723,934 flame lamps decreased to 590,185 and the electric lamps gained rapidly from 4,298 to 156,521. No later reliable figures are at hand.

Though coal was known to the ancients, the earliest mention being credited

to Theophratus, a Greek writer, about 371 B. C., the first known record of coal mining was made in England about 1180 A. D., the Bureau of Mines points out. It was at least 600 years later before the flame safety lamp was introduced. At first coal was undoubtedly obtained from outcrops, and mining was done by daylight. As the outcrops were worked out, the miners advanced gradually further and further into the coal bed, until the openings became quite extensive and somewhat resembled the small mines of today.

Even the approximate date when lamps or tallow candles were first used in mines is unknown, but some source of artificial light was probably used in metal mines long before coal mining began. Agricola, in a treatise on metal mining published in 1556, gives sketches that show conditions prevailing in his time. One of these sketches shows a miner carrying a lamp which apparently consisted of a wick dipped in grease or oil of some kind. This practice would naturally be extended to coal mines as the need developed. As the mine workings were extended underground, the amount of methane liberated into the mine atmosphere increased, rendering the open light a menace to safety and causing many disasters. Before flame safety lamps were introduced the mining of coal in gaseous mines was extremely hazardous.

The steel mill invented by Spedding about 1750 was a thin steel disk, so geared that it could be rotated rapidly by a hand crank. The light was produced by the shower of sparks that resulted from holding a piece of flint against the rim of the steel disk. Numerous explosions were attributed to the use of these mills. Owing to the distrust with which steel mills were regarded, it is probable that many miners reverted to using open-flame lamps, a practice that was still more dangerous. This undoubtedly brought about some of the disasters that occurred just before the introduction of the flame safety lamps. Altogether, coal mining conditions were deplorable at the beginning of the nineteenth century, and it is not strange that several men practically at the same time should attempt to develop a safer mode of lighting mines.

Dr. William Reid Clanny was undoubtedly the first to design a closed-flame lamp and the first to build a lamp and to have it actually tested underground in a gaseous atmosphere. His first model was made about 1811. George Stephenson made lamps of three distinct models and tested them underground in 1815. The first flame safety lamps, devised by Sir Humphry Davy, were put in service in January, 1816; by the end of that year they were in fairly

general use in the mines of the North of England district.

Flame safety lamps have been used in gaseous mines since the Davy lamp was introduced, more than 100 years ago.

Flame safety lamps are capable of doing more than the name indicates. First, under normal conditions, they can be used in a mine atmosphere that contains an explosive mixture of gas and air without great danger of exploding such a mixture, though such use of a flame lamp should not be permitted. Second, to an experienced man they indicate percentages of gas much lower than the explosive limit, and thus can be used to indicate to workers the approach of an unsafe condition in the mine atmosphere. Third, flame lamps will not burn in an atmosphere greatly deficient in oxygen, and they therefore warn the users of such deficiency in time to withdraw to a place of safety.

In Bulletin 227, by J. W. Paul, L. C. Ilsley, and E. J. Gleim, the Bureau of Mines has endeavored to compile a permanent record of a device which has served the mining industry for more than three generations. The bulletin contains an historical résumé of the development of the safety lamp; information on federal and state regulations governing the use of such lamps: data relative to the design, operation and maintenance of flame lamps; a description of lamp testing stations; and data regarding tests of flame safety lamps in gaseous atmospheres, tests of internal igniters, candle-power measurements, investigation of gauze fabrics, and tests in dust-laden atmospheres.

SAND AND GRAVEL SOLD IN 1923

HE sand and gravel sold in the THE sand and grant Tunited States in 1923 amounted to 139,932,153 short tons and was valued at \$90,903,654, according to reports made by the producers to the Geological Survey. These figures show an increase of about 48 percent in quantity and 41 percent in value over those for 1922. There was a general increase in both the quantity and the value of all classes of this material sold except in the value for filter sand. A special canvass of railroad companies was made in 1923 in order to obtain more complete reports of non-commercial material used by them, and the figures obtained make up in part the large increase (146 percent) shown in the quantity of gravel used for railroad ballast. The sale of sand and gravel for use in the construction of buildings and pavements also showed a large increase. The figures for 1923 include returns obtained from 2,428 sand and gravel plants, which is 443 more than the number represented by the figure for 1922.

NATIONALIZING OUR NATURAL RESOURCES

Practicality Of Government Ownership Or Operation Political Myth—Misleading Propaganda Exposed—Fallacious Doctrines Destroyed By Analysis Of Facts—Agricultural Burden Increased By Creation Of Enormous Tax Exempt Wealth—Future Generations Deprived Of Initiative

HE "bunk" that is being given the farmers of the country is an insult to their intelligence. They are being told by demagogues and fools that we should have government ownership of railroads, public utilities, and all natural resources.

That means, first, placing about seven and one-half millions of men on the government payroll who are now being paid by private enterprise. It is not only putting them on the Government payroll but they would quickly be placed under civil service, which would mean supporting them for life, whether or not they rendered any proper service therefor, with a retirement pension added.

When is the Government going to place the seven million farmers under civil service and on the payroll of the Government? They certainly are as much entitled to it and their work is as necessary for the good of mankind and the country.

Where is the farmer going to reap any advantage at all by placing this army of more than seven millions at work for life for the Government, where their wages would be free from the fluctuating conditions of commerce, transportation, etc.? Where is the farmer being granted regular rainfall, plenty of fertilizer and the curbing of destructive winds that he may live peacefully and happily ever after? Where is the farmer's retirement pension?

Farmers at the present time pay about 70 cents per acre in taxes. They pay almost nothing to support the Government. Not having a large income, or making great profits, he is not reached by the federal revenue requirements. His taxes are almost wholly absorbed by county and state.

Statistics for 1921 show \$125,000,000 paid for taxes by mines and quarries. Transportation, railroads, etc., for the same year, statistics show, paid over \$535,000,000 taxes annually. gives a grand total of over \$660,000,000 in taxes paid annually by those special industries selected by demagogues and others to be taken over by the Government and operated by it. All government property is, of course, exempt from taxation. That means that small property owners must pay these annual taxes of over \$660,000,000 in addition to the taxes that they now pay, because all of those properties mentioned must be By George H. Bailey*

protected and given the benefits of government in their operation that they are receiving now.

Then, they tell you the railroads, public utilities and natural resources must be purchased and owned by the Government. Therefore we must find out the value of these properties. We find them to be worth over \$35,000,000,000. To pay interest thereon would approximately double our present tax. The figures given are taken from the United States tax statistics of mining and transportation companies and from the United States Department of Labor reports.

Mineral in the ground, in its natural state, is probably the most worthless product of the Divine Creator. Given man's brains, knowledge and enterprise in the discovery, treating, transportation and manufacture of the minerals—add to that a market, created or developed, and you have the greatest and most wonderful contribution to human happiness enjoyed by man.

The farm lands, rough and untilled, could, and in many parts of the world, do sustain life, but only when given the products of the mines can the lands be tilled well or successfully. Farm lands and mineral lands originally all belonged to the Government. Title to them was given to those complying with the laws to develop them. The development of both, the products of both, and the growth and interrelations of both, have made this the greatest, wealthiest and happiest country in the world.

One man or one family may start and successfully operate a farm. Many men must cooperate to develop a mine, and many must cooperate to furnish the money for its development and operation.

These are all natural resources—the products of the mine and the products of the farm—and there is no more reason that one should be owned and operated by the Government than that the other should be owned and operated by the Government.

GOVERNMENT OPERATION WITH PRIVATE OWNERSHIP

Some or the more timid disseminators of "bunk", lately becoming afraid someone would show the people the outrage government ownership would inflict upon them, say they are in favor of government operation with private ownership.

In coal mining there is invested nearly two and a half billion dollars. The average annual profit in the coal industry for the last ten years is estimated at less than 3 percent on the investment; many years there was no profit, losses being greater in some mines than profits in others. This is far below what is considered a just and equitable return on the investment.

In metal mining over the same period the same condition would be shown and all of the metals would have to sell at a higher rate in order to produce a just and equitable profit.

In railroads we have an actual illustration of government operation and private ownership. During the war period, under government operation wages of Class I railroads increased from \$1,739,482,142 in 1917 to \$3,681,801,193 in 1920. Following 1920, with the railroads again under private operation, wages were increased; over 300,000 employes dismissed who went into other industries; more freight was handled than ever before in the history of the railroads at a saving of over \$600,000,000,000 per year.

This saving also made possible reduction in freight rates which had been boosted enormously during the period of government control. We could hardly have a better example of the inefficiency, loss, and poor service than government operation and private ownership gave us.

GOVERNMENT CONTROL WITHOUT OWNER-SHIP OR OPERATION

We do not need government control unless it will give us more of the product sought to be controlled, or give it to us at a cheaper price.

Government control would increase the cost of every product controlled, because it destroys initiative, and adds to both labor and overhead costs. In coal and in high cost metal mines it would raise the price in order to give a fair annual profit of 6 percent on the investment.

Take coal as an example. Without any government control or interference, coal has been furnished to the people and the industries of the country over a period of more than half a century cheaper than anywhere in the world. This supply has been continuous

throughout all the years with one exception—except when there have been strikes in the mines or on the railroads.

Stop strikes or control them and there cannot fail to be cheap coal for all, for ... ore than a thousand years. Why control coal when it will not give you cheap coal, or more coal?

If coal under government control would give larger profits to the producers, you will ask, why are the operators not in favor of it? Nearly all would be in favor of it if you could convince each operator that his mines would be operated if under government control.

The facts are, that one-third of the bituminous coal mines must close, and each producer is afraid his properties would be the ones closed, and with his mines closed he would lose them because he would have no way to raise money to pay mortgages or the taxes so he is afraid to take a chance. In the last ten months about 15 percent of the bituminous coal operations have closed down, or have gone into bankruptcy and within a year as many more will go the same way.

The relative mortality has been, and is, much greater among the bituminous coal producers than among the farmers. No such ratio applies to them.

ANTHRACITE

Under government operation, the anthracite mines would close, as the Government would never be able to supply the technical skill and organization required to mine the coal cheap enough to sell it.

Anthracite as an industry has never paid 6 percent annual profits over any period of years, and the price cannot be raised, as bituminous coal and other fuel will supplant it, as people know it is not a necessity.

METAL MINING

Where will the metal mining industry be under government control? Government control can limit the profits but cannot increase the output. That is all it can do. (Present conditions and taxes have almost crushed the metal mining industry today.)

The hope of extraordinary profits has ever been the magnet that drew men to search and explore the mountains and hills in the remote parts of the country for ore, and the great mines of the country today are the fulfillment of that hope, and were based on the guarantee of the Government that every citizen would be protected in what he found. That guarantee caused millions of dollars to be expended in prospecting from one end of the country to the other and those millions are gone forever.

Could the Government have prospected

the country and developed the mines we now have? Could you imagine any congressman voting the millions of dollars necessary to be expended in prospecting? Then the hundreds of mine failures! The Senate and House investigations! Can you see them? Can you see government control opening or creating a single mine in this whole country?

OIL

The same can be said of oil. No one puts his money or time into the extra hazard of oil development except for the hope of extraordinary profits. If the Government had limited the profits in the oil industry fifty years ago, there would be no oil industry today. Yet it is one of the greatest industries in the world. All you have to do is limit the profits today and no "wildcat" well will go down, and when the present wells give out in a few years there will be no oil industry, or gasoline for your autos. Can you imagine congressmen and senators voting money to put down "wildcat" oil wells to find new oil territory? Can you see an oil industry built up in

So it is with all branches of the mining industry. Take away the hope of extraordinary profits and there will be no prospecting, and in from ten to thirty years, when the present discovered deposits are worked out, there will be no metal mining industry.

The only thing government control could do, besides increase the cost of the products is to limit the profits of the producer and the wages of the worker.

POST OFFICE EXAMPLE

It is pointed out that the United States Post Office is the greatest and most wonderful postal service given any people in the whole world, and it is owned, controlled and operated by the Government. It is a business having 51,393 offices, owning 1,232 and renting 5,943 buildings of the values of hundreds of millions of dollars. It has 351,000 employes to whom it pays nearly a half billion dollars. Its expenses are over 500 million dollars per year.

There is no question but that it is the best and greatest post office department and postal service in the world. We have a right to have pride in it, but as a business it is probably the most colossal failure on the continent.

If its deficit falls as low as \$30,000,000 in any year, it is called splendid—wonderful. Its property pays no taxes; it has no competition; it is given aid and protection free by every town, city, county and state. They do not even get free postage. It pays no interest on the investment; it pays no insurance on its property. When its property is des-

troyed we build again direct from the Treasury.

If it paid its way as every other business has to do, its taxes, interest, insurance, etc., would amount to an annual loss of so many hundreds of millions of dollars that we would have to double the rates or close it up.

We see that the Government cannot extend its ownership and operation or control to other industries without sinking the ship of state.

All the government losses are paid by your taxes from the United States Treasury. The Post Office loss of many millions of dollars annually; government operation of the railroads loss in less than three years' operation of nearly one billion and a half dollars; and government ownership and operation of ships loss to date of over 3 billion dollars with a total property of the value now of but 245 million dollars, and a continuing annual loss estimated at 40 million dollars is the nearest a success the Government has been able to make of its operations in business. Who wants to live in this country when you must pay taxes to make up losses by the Government, with the Government taking over all the other large business interests and leaving less and less property to be taxed to pay the expenses of the operation of the Government itself.

I venture to say that only those who work for the Government or hope to work for the Government will be anxious to further force it into business. Certainly no one who pays, or expects to pay taxes will approve such measures.

Let us look at another phase. Making the coldest possible comparative analysis of the Government of the United States with the other governments of the world, we find that it has given the country an unprecedented growth; the people unprecedented freedom and unprecedented success in wealth, comfort and happiness. The ambition of the people has been stimulated; their energy aroused and their accomplishment in a century has been unprecedented in all that makes for happiness; all that makes for learning and culture; all that makes for unity and good fellowship.

Opportunity has beckoned to the spirit of enterprise in every land, and from every land have come to us their most persevering and indomitable men, to work out their destiny and ours, only restricted in that his effort must not injure others.

This greatest governmental success was not obtained by governmental restriction, interference, or control. Men who had nothing but their hands and brains have been the men who have made this country great in commerce, in the professions, in statesmanship and protected it in war. You can hardly

find at the head of any large enterprise in the United States today a man who started life with ease or with an abundance of money. In almost every instance he has been a creator of his own destiny, and his present position is the reward of his untiring effort and perseverance.

The growth of business has been possible only because the profits made by the men who had little or nothing to start with have been used to increase the business, or to develop a new enterprise creating more labor, more markets, more cities, more homes and more happiness.

In no place in the world is labor given so great reward, nor does it live in so great comfort; in no other country are there so few who can be called poor. The men and women in this country who do the great bulk of labor, which is the foundation of our business life, have more leisure, wear better clothes, eat better food, and have more pleasures and enjoyment, than was possible to all the kings and nabobs of all the world before the last twenty-five or fifty years. And the workers now have as great an opportunity to rise as they ever had in the past.

It is the striking history of this country that the worker of today is the manager and leader of tomorrow, in every walk of our national life. Railroad section hands have become railroad presidents and bankers; coal and steel laborers have become members of President's cabinets; but did any civil service employe or mail carrier every become Postmaster General, or rise and reap the high rewards of life as has the worker under conditions where his ambition and energy were given full play and freedom? Let us not fix a limit to opportunity; let us not set the brakes against success; let us not rebuke ambition and destroy hope.

We have worked out the greatest of destinies thus far. Why change all this? Why stamp out opportunity for your son, and my son, your daughter and my daughter? Why wipe out the opportunities they might have and deny to them the stimulant of ambition to develop the best that is in them?

The Coal Division of the Department of Commerce reports that American coal mines are much in advance in the matter of up-to-date mining appliances as compared to conditions in Scotland. "Miners who have worked in Fifeshire, Scotland, and in Pennsylvania and West Virginia prefer the labor-saving machinery in American mines."

In cooperation with the Du Pont Company, the Bureau of Mines is producing a motion-picture film on dynamite.

FIRST AID CONTEST

West Virginia Coal Operators Sponsor Large Meet—Bureau Of Mines And Red Cross Cooperating

PLANS for the largest first-aid contest ever sponsored by the Virginia Coal Operators' Association have been approved, and details of the banner event are now in the hands of a special committee, of which J. K. Taggart, general manager of the Norton Coal Company, is chairman. This committee announces Saturday, September 20, as the tentative date for the meeting, to be held at the ball park, Norton, Va. The 1924 contest will be the sixth annual contest put on by the Virginia operators. Fifty teams are expected to compete for the prizes.

The committee in charge of the contest this year is composed of:

J. K. Taggart, chairman, general manager, Norton Coal Company, Norton, Va.; Geo. J. Walker, general manager, Banner Raven Coal Corporation, Drill, Va.; R. E. Taggart, vice-president, Stonega Coke and Coal Co., Big Stone Gap, Va.; Geo. M. Thorn, general manager, Blackwood Coal and Coke Co., Blackwood, Va.; J. B. Fleming, president, Robt. Fleming and Company, Norton, Va.; Geo. E. Smith, general manager, Wise Coal and Coke Company, Dorchester, Va.

The cup given by the association to the team making the highest score is the big prize offering. This cup is now in possession of a Norton Coal Company team which, under the leadership of H. E. Lyons, captain, won it at the fifth annual contest, August 4, 1923, in which nearly thirty teams participated. Second place last year went to the Dante team of the Clinchfield Coal Corporation. captained by Claude Alley. These two, and two other teams, represented the Virginia field at the National First Aid and Mine Rescue Meet held at Salt Lake City, Utah, last August. At the national meet the Wilder team, of the Clinchfield Coal Corporation, won second place and the Dante team, from the same company, third place. The Wilder team won second place at the national meet in 1921 and has held second place continuously since that time.

Joining with the Virginia Coal Operators Association in putting over the Sixth Annual Contest is the American Red Cross and the U. S. Bureau of Mines. With the National First Aid Meet abandoned this year, promises are that the Virginia Statewide Contest will be more largely attended than ever. Opportunity for the winning teams to have a trip to the National Meet will, of course, be lacking, but sufficient prizes will be provided to make the contest well worth the effort, funds for the purpose being provided by the Association and other prizes being given by some of the

larger commercial firms of the mining section.

The Virginia Coal Operators Association cup which is given annually to the team making the highest score in all events, is the prize most enthusiastically sought and serves to spur forward from the ranks of the great number of trained first-aid men in the Virginia coal fields, the best talent developed by careful study and intensive training. Of no lesser importance is the fact that the Life Savings and First Aid Division of the American Red Cross gives annually six bronze medals and six certificates, and the National Safety Council gives six silver medals to be awarded to contestants under rules adopted by the committee in charge. In addition to all these there is provided annually merchandise prizes amounting in value to more than \$1,000, awarded under the rules of the committee.

Detail plans for the meet including rules, regulations and the selection of judges will be announced in the next few days by the contest committee. An effort has been made by the committee to formulate such rules and regulations as to insure impartial and intelligent competitive judging of the teams entered and no efforts will be spared by the committee to make the contest a success from that standpoint.

"INDUSTRIAL TYPE" SPUR GEAR SPEED TRANSFORMER

THE Hill Clutch Machine and Foundry Company, Cleveland, Ohio, have developed the "Industrial Type" spur gear speed transformer, realizing the need for an efficient and durable speed-changing device for such service as is encountered in connection with conveyor drives in mines, smelters, steel plants and re-fineries. The transformer consists of a nest of plain spur gear revolving in oil. changing the revolutions per minute of the input shaft to some desired revolutions per minute of the output shaft. The power transmitted is the same in both shafts. The gears all have 20° involute form cut teeth. The short length of these teeth combined with their powerful cross section insures great strength and reliability.

Of great importance is the central housing located in the main frame. With this construction the transformer has both high and low speed shafts supported in double bronze bearings, insuring strength, rigidity and quiet operation. It is made in seven sizes.

Catalogs and bulletins will be mailed upon request.

PRINCIPLES OF PRESIDENTIAL CANDIDATES

Salient Points In Speeches Of Acceptance

Calvin Coolidge

Perhaps in no peace-time period have there been more remarkable and constructive achievements than since March, 1921

Our foreign relations have been handled with a technical skill and a broad statesmanship which has seldom, if ever, been surpassed.

The finances of this nation have been managed with a genius and a success unmatched since the days of Hamilton.

Restricted immigration is not an offensive but a purely defensive action.

By means of a protective tariff we have saved American agriculture, labor and industry from the menace of having their great home market destroyed through the dumping upon it of a flood of foreign products.

The government is sound. But individuals charged with wrongdoing are being prosecuted. The people of this country hate corruption. They know my position. They know the law will be enforced.

I favor the American system of individual enterprise, and I am opposed to government ownership and control.

I believe in a reduction and reform of taxation.

The foreign policy of America can best be described by one word—peace.

Permanent Court of International Justice.

Republican rule has raised the wage earner to higher standard than he ever occupied before anywhere in the world.

John W. Davis

Honest, impartial, just government. Constitutional guarantees of religious

freedom.
Enforcement of all laws, including the

prohibition amendment,

Agricultural aid through the revision of the tariff; co-operative marketing principle.

Reduction in taxation and revision of the tariff.

Economy in government. Government employes' pay equal to that received from private employers for similar work.

Approval of the world court.

Cooperation officially with the legitimate endeavors, whether from the League of Nations or from any other source, to lessen the prospects of war, to aid in repairing the ravages of past wars, to promote disarmament and to advance the well-being of mankind.

Maintain means of adequate national

Right of Labor to organize and to bargain collectively.

The protection of women and children from human greed and unequal laws.

Prevention of child labor and suppression of the illicit traffic in soul-destroying drugs.

Grateful care to the veterans of our wars, especially to those who were stricken and wounded in the country's service.

Conservation of all of the natural resources of the country.

R. M. La Follette

Use of the power of Federal government to crush private monopoly.

Unqualified enforcement of the constitutional guarantees of freedom of speech, press and assemblage.

Public ownership of the nation's water power and creation of a public superpower system. State public control and permanent conservation of all natural resources, including coal, iron and other ores, oil and timber lands, in the interest of the people.

Retention of surtaxes; tax on excess profits, taxation of stock dividends, profits undistributed rapidly, progressive taxes on large estates and inheritances, and repeal of excessive tariff duties.

Reconstruction of the Federal Reserve and Federal Farm Loan Systems to provide for direct public control of the nation's money and credit.

Guarantee to farmers and industrial workers the right to organize and bargain collectively.

Creation of a government marketing corporation.

Repeal of the Cummins-Esch law. Public ownership of railroads.

Abolition of the tyranny and usurpation of the courts, including the practice of nullifying legislation in conflict with the political, social or economic theories of the judges. Abolition of injunctions in labor disputes.

Ratification child labor amendment. Waterway Great Lakes to sea.



NATIONAL LEGISLATION

Review Of Work Of Sixty-eighth Congress And Forecast Of Pending Legislation-Many Mining Bills In Hopper-Vast Appropriations Involved-Short Session Will Preclude Consideration General Measures

ONGRESS thinks in big figures. Committee on Agriculture At least the last session of the substituted a proposal for 68th Congress did, for in legislating for the nation it introduced bills carrying in the aggregate appropriations amounting to practically seven billions of dollars. Of this amount this session succeeded in securing final enactment of measures carrying \$3,883,858,727, leaving now pending for action by the final session of the 68th Congress bills authorizing expenditure of approximately four billion dollars. Of the total passed more than three billions was for the upkeep of government, the Bureau of Mines and Geological Survey receiving \$3,606,950.

The bills reviewed in this issue would authorize an expenditure of \$3,043,556,-287, in all of which measures the mining industry both directly and indirectly is interested. Of the total amount finally appropriated \$60,375,000 was incorporated in measures of mining interest, including \$50,000,000 for shipping; \$5,000,000 for an inland waterways corporation; \$2,700,000 for forestry; approximately \$2,500,000 for payment of war mineral claims; \$100,000 for prosecution of naval oil leases; \$50,000 for investigation of pollution of streams and \$25,000 for investigation of arsenic ore lands. The mining industry therefore is interested in measures pending before the Congress convening December 1, 1924. carrying appropriations \$2,083,181,287.

When the justly famed 68th Congress convenes for its final session it will face a veritable mountain of work and with only three months to complete its task it is obvious that it cannot devote any time to general measures. First consideration will of course be given to the regular appropriation bills for the support of the Government for the year beginning July 1, 1925. A new session always brings up new questions and many of the hold-over measures will be forced into the discard, because of lack of time for consideration.

The lease of the Muscle Shoals, Ala., nitrate and power project is slated for consideration by the Senate December 3rd. The House passed a bill leasing the plant to Henry Ford, but the Senate

its operation under a Federal Chemical and Power Corporation. No time has been fixed for the Senate to vote on this proposal, and debate thereon may continue several weeks.

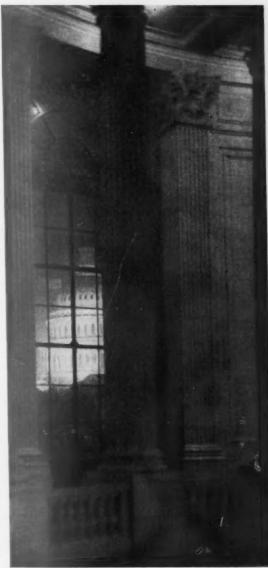
Other measures on the Senate Calendar subject to action are bills appropriating \$10,000,000 for the purchase and sale by the Government of calcium arsenate, and creating an Alien Property Trade Investment Corporation to sell raw materials in Germany.

Railroad legislation is likely to command consideration. The Senate is scheduled to act on a conference report on a bill directing the Interstate Commerce Commission to readjust freight rates. The House has already agreed to the report. The Barkley bill to abolish the Railroad Labor Board is unfinished business in the

Another bill on the unfinished calendar of the House is the Denison Blue Sky bill which was last debated on March 19th,

and which debate was not concluded. Further legislation directed against pollution of streams by oil and other substances is a possibility. At the last session a law was passed forbidding the discharge by oil-burning and oilcarrying vessels of oil into coastal navigable waters. The law directed a report by the War Department as to other sources of pollution, which is expected to be made in December. The House has on its calendar a bill reported by its River and Harbor Committee forbidding the pollution of streams by oil wells, refineries and oil storage plants.

Reorganization of the government departments may be attempted. Bills are pending on both Senate and House calendars to regroup government bureaus, which call for the transfer of



(c) Ernest L. Crandail

the Bureau of Mines from the Interior to the Commerce Department.

in the field of labor, a bill is on the House calendar to forbid the transportation of strike breakers unless they are informed of conditions in the district to which they may be sent. This bill has come up for consideration several times but opposition has prevented action.

A tabulated summary of legislation enacted at the last session, together with bills pending for action by the reconvened Congress, is herewith submitted. This tabulation shows these measures divided into thirteen general heads, including mining, currency, coal, taxation, trade regulation, power development, transportation rail, transportation water, oil, tariff, war control, labor and immigration, giving the author, appropriation and present status.

0.	Introduced by	Object ·	Ap	propriation	Committee Reference	Status
			MINI			
79	Oddie (R., Nev.) Shortridge (R., Calif.)	Dept. of Mines		\$50,000	Mines & Mining	In Committee
37 04	King (D., Utah) Huddleston (D., Ala.)	Western Branch, Interio	or Dept	1,000,000	Public Lands	In Committee
R. 7352 R. 9629	Huddleston (D., Ala.)	Dept. of Natural Resour	rces		Public Lands	In Committee
t. 9629 445	Mapes (R., Ill.)	Mines Bureau Transfer			Reorganization of Govt. Depts Reorganization of Govt. Depts	Senate Calendar
797	Smoot (R., Utah). Oddie (R., Nev.). Raker (D., Calif.). Raker (D., Calif.). Pittman (D., Nev.). Pittman (D., Nev.).	War Mineral Relief		2,500,000	Mines & Mining	Law
. 8709 . 112	Raker (D., Calif.)	War Mineral Kellef	******	********	Mines & Mining	In Committee
es. 71	Pittman (D., Nev.)	War Mineral Inquiry			Mines & Mining	In Committee
17	Pittman (D., Nev.) Denison (R., Ill.) McClintic (D., Okla.)	Rine Sky	*****	*******	Banking	Passed Senate
1. 80	McClintie (D., Okla.)	Blue Sky			Interstate Commerce	In Committee
826 596	McNary (R., Ore.) Capper (R., Kans.)	Blue Sky		50,000	Judiciary	In Committee
L 6139 L 7310	Christopherson (R. S. D.) Fulmer (D., S. C.)	Blue Sky		30,000	Judiciary	In Committee
. 7310 58	Fulmer (D., S. C.)	Blue Sky		********	Judiciary Judiciary Banking	In Committee
Res. 74	Owen (D., Okla.). Frazier (R., N. D.). Wefald (R., Minn.). King (D., Utah). Sutherland (R., Alaska).	Stock Reports			Finance	in Committee
. Res. 179	Wefald (R., Minn.)	Stock Reports			Rules Mines & Mining Mines & Mining	'n Committee
1 4148	Sutherland (R., Alaska)	Placer Claims			Mines & Mining	In Committee
Res. 142	Brumm (R., Pa.)	Assessment Suspension			Mines & Mining	House Calendar
6 . 177	Thomas (D. Okla.)	Mine Leases			Indian Affairs	In Committee
. 3852	Brumm (R., Pa.)	Indian Leases			Agriculture Indian Affairs	J.aw
98				200,000	Indian Affairs	Law
. 9400	Raker (D., Calif.) Wurzbach (R., Texas) Smoot (R., Utah)	Mine Claims		200,000	Appropriations Mines & Mining. Public Lands	In Committee
112 181)	Smoot (R., Utah)	Mineral Lands	*******	********	Public Lands	In Committee
82 }	Phipps (R., Colo.)	Mineral Rights		*******	Public Lands	In Committee
83]						
. 7148 315	Colton (R., Utah) Harreld (R., Okla.)	Indian Mineral Lands.	********		Public Lands	In Committee
. 6483	Howard (D., Okla.)	Indian Mineral Lands.		********	Indian Affairs	Law
1 . 2907	Smoot (R., Utah) Taylor (D., Colo.)	Mineral Lands	*******	*********	Public Lands	In Committee
. 4516)						
. 4972 } . 9019	Leatherwood (R., Utah)				Public Lands	
. 9019	Sutherland (R., Alaska) Ashurst (D., Ariz.)	Alaska Mine Laws		\$200,000	Public Lands	In Committee
. 9030				********	Public Lands	n Committee
. Res. 60	Sinhott (R., Ore.) Sutherland (R., Alaska). O'Connell (D., N. Y). King (D., Utah). Sanders (R., Ind.). Davis (R., Minn.) Reed (R., N. Y.). Reed (R., N. Y.). Lodge (R., Mass.)	Highways to Mines		100 000	Territories	House Calendar
0	King (D., Utah)	Oil Shale	********	100,000 500,000	Public Lands. Mines & Mining. Mines & Mining.	In Committee
. 565	Sanders (R., Ind.)	Mine Rescue Station		7,800	Mines & Mining	In Committee
. 480 Res. 261	Reed (R. N. Y.)	Mine Exposition		100,000 700,000	Expositions	In Committee
Res. 268	Reed (R., N. Y.)	Mine Exposition	******	700,000	Expositions	House Calendar
Res. 130	Lodge (R., Mass.)	Mine Exposition		700,000	Foreign Affairs	Passed Senate
)25)47	Bloom (D., N. Y.) Sheppard (D., Tex.) Sheppard (D., Tex.)	Potash Survey	*******	2,500,000	Agriculture	In Committee
. 6361	Sheppard (D., Tex.)	Potash Survey		3,000,000	Agriculture	Passed Senate
05	Hudspeth (D., Tex.) Ladd (R., N. D.)	Potash Leases	********	5,000,000	Agriculture	In Committee
. 9029	Sinnott (K., Ure.)	POIRSD Leases			Public Lands	In Committee
. 9536 . Res. 269	Berger (Soc., Wis.)	Natural Resource Conf	trol		Judiciary	In Committee
. Res. 291	Berger (Soc., Wis.) Berger (Soc., Wis.) Bacon (R., N. Y.)	Natural Resource Cont	trol		Judiciary Judiciary Foreign Affairs	In Committee
4522	Gibson (R., Vt.). Temple (R., Pa.)	Mine Trade Corporation	on	37,200,000	Judiciary	In Committee
1. 4522 2. 756						
t. 5722 § 166	Kahn (R., Cal.)	Helium Development	*******	5,000,000	Military	
1. 7696	Oddie (R., Nev.) Sutherland (R., Alaska). Sheppard (D., Tex.)	Mine Timber	*******	5,000,000	Public Lands	In Committee
147	Sheppard (D., Tex.)	Land Holding Inquiry		********	Public Lands	In Committee
			CURRE	ENCY		
84 8. 494	Goldsborough (D. Md.)	Commodity Dollar			Banking	In Committee
2. 488	Burtness (R., N. D.)	Commodity Dollar			Banking	In Committee
k. 88 . Res. 243	Ladd (R., N. D.)	Commodity Dollar	* * * * * * * * * *	********	Banking	In Committee
. Kes. 243	Smoot (R., Utah)	Transport Silver Coin-	S	25,000	Rules Finance	In Committee
34	Smoot (R., Utah)	Memorial Coinage	** * * * * * * * * * * * * * * * * * * *	20,000	Finance	Law
. 5259 . Res. 259	Luce (R., Mass.)	Memorial Coinage	** * * * * * * * * *	*****	Coinage Library	Law Passed House
2. 7040	Wolff (D., Mo.)	Memorial Coinage			Coinage	In Committee
. Res. 255 . Res. 256	Wolff (D., Mo.)	Memorial Coinage			Library	In Committee
. Res. 263	Beedy (R., Mass.) Beedy (R., Me.) Copeland (D., N. Y.) Johnson (R., Wash.). Jones (R., Wash.). Sweet (R., N. Y.)	Memorial Coinage	*********		Library Library Library	In Committee
Res. 128	Copeland (D., N. Y.)	Memorial Coinage			Library	In Committee
317	Jones (R., Wash.)	Memorial Coinage			Coinage	In Committee
. 9489	Sweet (R., N. Y.)	Memorial Coinage		*******	Coinage	In Committee
			CO	AL .		
945	Norris (R., Neb.)	Government Control		\$500,000	Interstate Commerce	In Committee
. 4134	Newton (R., Minn.) Treadway (R., Mass.)	Government Regulation	n	150,000	Interstate Commerce	In Committee
436	Blanton (D., Tex.)	Strike Prevention			Interstate Commerce	In Committee
. 757	Treadway (R., Mass.)	Anthracite Regulation			Interstate Commerce	In Committee
208 L. 8335	Treadway (R., Mass.). Blanton (D., Tex.). Treadway (R., Mass.). Borah (R., Ida.). Eagan (D., N. J.). Luce (R., Mass.). Taber (R., N. Y.). Rogers (R., Mass.).	Anthracite Regulation.			Interstate Commerce	In Committee
8. 698	Luce (R., Mass.)	Anthracite Standards.			Interstate Commerce	In Committee
	Rogers (R., Mass.)	Impure Coal			Interstate Commerce	In Committee
t. 9195	Rogers (R., Mass.)	Anthracite Export Em	abargo		Interstate Commerce Interstate Commerce	In Committee
t. 9195 t. 15 t. 418		Government Lands			Public Lands	In Committee
R. 9195 R. 15 R. 418 756	Lenroot (R., Wis.)				Public Lands	On Table
R. 9195 R. 15 R. 418 756 R. 6713 Les. 160	Lenroot (R., Wis.) Sinnott (R., Ore.) LaFollette (R., Wis.)	Government Lands			ATOMS APARTERIATED ATTACHER OF THE	OH I BUIL
R. 9195 R. 15 R. 418 756 R. 6713 Les. 160 Res. 48	Lenroot (R., Wis.) Sinnott (R., Ore.) LaFollette (R., Wis.) Newton (R., Minn.)	Government Lands Alaskan Lands North Dakota Rates	*********		Rules	In Committee
R. 9195 R. 15 R. 418 756 R. 6713 Res. 160 Res. 48	Lenroot (R., Wis.)	Government Lands Alaskan Lands North Dakota Rates Publish Coal Com. Re	ports		Rules	In Committee Passed Senate
R. 9195 R. 15 R. 418 756 R. 6713 Les. 160 Res. 48	Taber (R., N. Y.) Rogers (R. Mass.) Rogers (R. Mass.) Lenroot (R., Wis.) Sinnott (R., Ore.) LaFollette (R., Wis.) Newton (R., Minn.) Oddie (R., Nev.) Treadway (R., Mass.)	Government Lands Alaskan Lands North Dakota Rates Publish Coal Com. Re Create Coal Committee	ports		Rules	In Committee Passed Senate
l. 9195 l. 15 l. 418 756 l. 6713 les. 160 les. 48 on. Res. 3 les. 53			TAXA	* * * * * * * * * * * * * * * * * * * *	Rules	In Committee Passed Senate
3. 9195 3. 15 3. 418 756 3. 6713 4es. 160 Res. 48 5on. Res. 3		Revenue Povision	TAXA	* * * * * * * * * * * * * * * * * * * *	Rules	In CommitteePassed SenateIn Committee

(0.	Introduced by		Appropriation	Committee Reference	Status
D 0045	0-10- (D 25 25)	TAXATION-	-(Continued)		
R. 8048 J. Res. 1	Griffin (D., N. Y.) Green (R., Iowa)	Tax on Securities	********	Ways & Means	In Committee
J. Res. 136	Green (R., Iowa)	Tax on Securities	********	Ways & Means	Defeated in House
R. 4524	Front (B Wig)	Tay on Securities	*******	Ways & Means. Ways & Means. Ways & Means. Ways & Means.	In Committee
J. Res. 161 J. Res. 174	Huddleston (D., Ala.)	ed) Tax on Securities	********	Ways & Means. Ways & Means. Ways & Means. Ways & Means.	In Committee
J. Res. 193	Oliver (D., N. Y.)	. Tax on Securities	********	Ways & Means.	In Committee
R. 2691 Res. 110	Watkins (D., Ore.)	Corporation Farnings Report			
R. 4137)				None	Passed Senate
R. 4138 S		Corporation Dividend Tax		Ways & Means	In Committee
R. 170 R. 6823	Kearns (R., Ohio)	Deduction of Losses	* * * * * * * * * * * * * * * * * * * *	Ways & Means	In Committee
tes. 56	King (D., Utah)	Exemptions and Refunds		Finance	In Committee
R. 6201 } R. 6901 }	Fairchild (R., N. Y.)	Credits and Refunds		Ways & Means	
273 R. 5735	Shortridge (R., Calif.)	Credits and Refunds	***-****	Finance	In Committee
R. 5735	Keller (R., Minn.)	Excess Profits Report	*******	Ways & Means.	in Committee
Res. 115 R. 4811	Frear (R., Wis.)	. Excess Profits	********		
R. 4814	Frear (R., Wis.)	Excess Profits	********	Ways & Means	In Committee
R. 5736 R. 5734	Keller (R. Minn.)	War Profits		Ways as means	n Committee
R. 5324	Beck (R., Wis.)	Estate Tax. Estate Tax. Fax Conference.	*********	Ways & Means	
R. 4812	Frear (R., Wis.)	Estate Tax	********	Ways & Means	In Committee
. Res. 30 Con. Res. 2	Vaile (B. Colo.)	Valuation Inquiry	\$25,000	rinance	In Committee
R. 4150	Strong (R., Kans.)	Inheritance Tax	*********	Coinage	In Committee
600	Capper (R., Kans.)	Inheritance Tax	*********	rinance	In Committee
R. 5091 R. 6783	McClintic (D. Okla.)	Inheritance Tax	********	Ways & Means	In Committee
R. 4813	Frenz (R. Wig.)	Gift Tax	********	Ways & Means	In Committee
R. 4815	Frear (R., Wis.)	Fax Publicity	********	Ways & Means	In Committee
R. 4833 J. Res. 176	Jeffers (D., Ala.)	Tax Publicity Tax Publicity Tax Publicity	********	ways a means	In Committee
I. Res. 177			********	Rules	In Committee
J. Res. 187	Vaile (R., Colo.)	Tax Publicity Oil Co., Inspection Oil Co., Inspection - Tax Indian Mineral Production - Depletion Report	********	Rules	In Committee
tes. 180 tes. 185	McKellar (D., Tenn.)	Oil Co., Inspection		None	Passed Senate
R. 2887	Snyder (R., N. Y.)	Tax Indian Mineral Production.		Indian Affairs	Passed Senate
les. 181	King (D., Utah)	Tay on Local Assess		Indian AffairsFinance.	In Committee
R. 4464 R. 4832	Stengle (D., N. Y.)	Tax on Local Assns. Tax Representation. Tax Assessments.		Ways & Means	In Committee
R. 5262	Brand (D., Ga.)	Tax Assessments			
R. 4440 R. 7784	Crisp (D., Ga.)	Tax Appeal Costs Tax Reduction Tax Reduction Tax Reduction Tax Reduction Tax Reduction	********	Ways & Means	In Committee
Res. 200	Ackerman (R., N. J.)	. Tax Reduction	********		
J Res. 215	Ackerman (R., N. J.)	Tax Reduction	********	Ways & Means	In Committee
J. Res. 212	Porter (E., Pa.)	Reduction	*******	Ways & Means	In Committee
			EGULATION		
15	Walsh (D., Mont.)	Anti-Trust Federal Trade Commission	********	Judiciary	In Committee
R. 716 .005	Johnson (R., Wash.)	Federal Trade Commission	* * * * * * * * *	Int. Commerce	In Committee
R. 646)			*****	e unicially	Senate Calendar
R. 647 S		Trade Contracts	******	Judiciary	House Calendar
112 1843	Capper (R., Kans.)	Export Associations	* *****	Int. Commerce	In Committee
J. Res. 3	Britten (R., Ill.)	Government Contracts	*** *****	Commerce	In Committee
R. 6782	Cramton (R., Mich.)	Government Contracts	******	e dilicially	In Committee
R. 7498 R. 5207	Wood (B., Ind.)	Government Purchases	********	Judiciary	In Committee
R. 5793	Gibson (R., Vt.)	D. C. Corporations		D. C. Int. Commerce	In Committee
R. 4517 R. 7084	Winslow (R., Mass.)	Trade Inquiry		Int. Commerce	Defeated
384	Jones (R., Wash.)	Trade Inquiry Trade Inquiry Foreign Trade Russian Trade	********		
R. 4081	Berger (Soc., Wis.)	Foreign Trade	1,000,000,000	Foreign Affairs.	In Committee
Res. 145 2570	Fish (R., N. X.)	Tue de Zerre		Foreign Affaire	· · · · · · · · · · · · · · · · · · ·
	Jones (R. Wash.)			Commerce	In Committee
710	Jones (R., Wash.) Dial (D., S. C.)	Raw Material Exports	150,000,000	Agriculture	Senate Calendar
2710 J. Res. 121	Dial (D., S. C.)	Raw Material Exports	150,000,000 150,000,000	Agriculture	Senate Calendar
710 . Res. 121 R. 7498	Dial (D., S. C.)	Raw Material Exports Raw Material Exports Raw Material Exports Trademarks	150,000,000 150,000,000	Agriculture	Senate Calendar
710 7. Res. 121 R. 7498 1679 R. 6069	Dial (D., S. C.)	Raw Material Exports Raw Material Exports Raw Material Exports Trademarks	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee
7.710 J. Res. 121 R. 7498 2679 R. 6069 J. Res. 78	Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.). Fulbright (D., Mo.) King (D., Utah).	Raw Material Exports. Raw Material Exports. Raw Material Exports. Trademarks. Mark Cost of Goods. Trade Conference.	150,000,000 150,000,000	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee In Committee
7.10 J. Res. 121 R. 7498 1679 R. 6069 J. Res. 78 R. 6871	Dial (D., S. C.). Dial (D., S. C.). Lowrey (D., Miss.) Ernst (R., Ky.). Fulbright (D., Mo.) King (D., Utah). Graham (R., Pa.).	Raw Material Exports. Raw Material Exports. Raw Material Exports. Trademarks. Mark Cost of Goods. Trade Conference. Corrupt Practices.	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee On Table
7.10 7. Res. 121 R. 7498 6679 R. 6069 J. Res. 78 R. 6871 R. 6645	Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa)	Raw Material Exports Raw Material Exports Raw Material Exports Prademarks Mark Cost of Goods Prade Conference Corrupt Practices Industrial Alcohol	150,000,000 150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Waya & Means	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee On Table In Committee In Committee
710 , Res. 121 R. 7498 679 R. 6069 , Res. 78 R. 6871 R. 6645	Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.)	Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee On Table In Committee In Committee On Table In Committee
710 . Res. 121 R. 7498 .679 R. 6069 . Res. 78 R. 6871 R. 6645	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., III.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee In Committee On Table In Committee On Table In Committee Passed House and Senate Calendar In Committee
710 . Res. 121 R. 7498 679 R. 6069 I. Res. 78 R. 6871 R. 6645 00 R. 10 R. 5942	Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Il.) Colton (R., Utah)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee On Table In Committee
710 Res. 121 R. 7498 679 R. 6069 Res. 78 R. 6871 R. 6645 00 R. 10 R. 5942	Jones (R., S. S.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Comage	Senate Calendar Senate Calendar Senate Calendar In Committee
7.710 1. Res. 121 1. Res. 121 1. Res. 121 1. Res. 129 1. Res. 669 1. Res. 78 1. 6871 1. 6645 1. Res. 6645 1. Res. 5942 1. 1070 1. 3240	Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Weights Weights	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Commerce Coinage Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee On Table In Committee
710 (Res. 121 R. 7498 679 R. 6069 (Res. 78 R. 6871 R. 6645 000 R. 10 R. 5942 1070 R. 3240 R. 4465 Res. 102	Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Prademarks Parademarks Mark Cost of Goods Prade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Weights Weights Patent Inquiry	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee In Committee In Committee On Table In Committee Passed House and Senate Calendar In Committee
710 (1. Res. 121 R. 7498 679 R. 6069 (1. Res. 78 R. 6871 R. 6645 600 R. 10 R. 5942 6070 R. 3240 R. 4465 68s. 102 R. 45790 R. 45790 R. 5790	Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., III.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Cramton (R., Minn.) Cramton (R., Minn.) Cramton (R., Minn.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Weights Weights Patent Inquiry Patent Administration	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Commerce Coinage Coinage Coinage Patents Patents	Senate Calendar Senate Calendar Senate Calendar In Committee In Committee In Committee On Table In Committee
710 (1. Res. 121 R. 7498 679 R. 6069 R. 6069 R. 6687 R. 6871 R. 6645 000 R. 10 R. 5942 0070 R. 3240 R. 4465 Res. 102 R. 4465 Res. 102 R. 3388	Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Shipstead (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Weights Weights Patent Inquiry Patent Administration Patent Secrecy	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Patents Patents Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Jones (R., vash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Cramton (R., Mish.) Cramton (R., Mish.) Ernst (R., Ky.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal Industrial Decimal System Decimal System Decimal System Decimal System Orights Weights Weights Weights Patent Inquiry Patent Secrecy Govt. Patent Board	150,000,000 150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Commerce Coinage Coinage Patents Patents Patents Patents Patents Patents Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstend (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.)	Raw Material Exports Prademarks Parademarks Parademarks Parademarks Parade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal System Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Pacific Cable	150,000,000	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Patents Patents Patents Patents Patents Commerce Coinage Coin	Senate Calendar Senate Calendar Senate Calendar In Committee
710 . Res. 121 . Res. 121 . Res. 121 . R. 7498 . 679 R. 6069 . Res. 78 R. 6871 R. 6645	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Cramton (R., Mish.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mish.) Jones (R., Wash.) Jones (R., Wash.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt. Patent Board Govt. Patent Board Pacific Cable Engineering Exposition	25,000 25,000 25,000	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Commerce Coinage Coinage Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
710 . Res. 121 . Res. 121 . Res. 121 . R. 7498 . 679 R. 6069 . Res. 78 R. 6871 R. 6645	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Cramton (R., Mish.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mish.) Jones (R., Wash.) Jones (R., Wash.)	Raw Material Exports Prademarks Parademarks Parademarks Parademarks Parade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal System Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Pacific Cable	25,000 25,500,000 1,490,000	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Patents Patents Patents Patents Patents Patents Patents Patents Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498 . R. 7498 . R. 7498 . R. 6069 . Res. 78 . R. 6871 . R. 6645	Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Dini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utsh) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utsh) King (D., Utsh) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt. Patent Board Govt. Patent Board Pacific Cable Engineering Exposition	25,000 25,000 25,000 26,500,000 (annually)	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Patents Patents Patents Patents Patents Patents Patents Patents Potents Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
710 . Res. 121 . Res. 121 . Res. 121 . Res. 121 . Res. 78 . G679 . G666 . Res. 78 . G645 . G6	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Il.) Colton (R., Utah) King (D., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Finst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Ueights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt. Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Experiments Soldier Bonus	25,000 25,000 25,000 25,000 21,490,000 (annually)	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Jones (R., Vash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstead (F-L., Minn.) Cramton (R., Mish.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mish.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Patent Inquiry Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Exposition Soldier Bonus Defrauding Govt	25,000 25,000 25,000 25,000 26,500,900 1,490,000 (annually)	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstend (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal System Decimal System Petent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Govt Patent Board Pacific Cable Engineering Exposition Engineering Experiments Soldier Bonus Defrauding Govt. Defrauding Govt.	25,000 25,000 25,000 25,000 25,000 4,490,000 (annually)	Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Paten	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498 Res. 1498 Res. 78 . R. 6871 . R. 6645	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D.) Sutherland (R., Alaska)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Exposition Defrauding Govt Protect Property Alaskan Officials	25,000 25,000 25,000 25,000 21,400,000 21,400,000	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Potents Potents Foreign Affairs Education Ways & Means Judiciary Postal Territories	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstead (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D.) Sutherland (R., Alaska) Clarke (R., N. Y.)	Raw Material Exports Raw Material Exports Raw Material Exports Raw Material Exports Prademarks Prademarks Mark Cost of Goods Prade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal System Patent Inquiry Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Govt Patent Board Soldier Bonus Engineering Exposition Engineering Experiments Soldier Bonus Defrauding Govt Protect Property Alaskan Officials Forest Lands	25,000 25,000 25,000 25,000 26,500,900 1,490,000 (annually)	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Poreign Affairs Education Judiciary Postal Territories Agriculture	Senate Calendar Senate Calendar Senate Calendar In Committee
7.710 . Res. 121 . Res. 1498 . 1679 . R. 6069 . R. 6069 . R. 6645 . 1600	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Colton (R., Mich.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D.) Suthérland (R., Alaska) Clarke (R., N. Y.) Huddleston (D., Ala.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Exposition Defrauding Govt Protect Property Alaskan Officials	25,000 25,000 25,000 25,000 21,400,000 21,400,000	Agriculture Agriculture Agriculture Patents Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Age Coinage Coina	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 . Res. 121 . Res. 1498	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstend (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D., Sutherland (R., Alaska) Clarke (R., N. Y.) Huddleston (D., Ala.) Brand (D., Ga.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Decimal System Decimal System Decimal System Decimal System Decimal System Decimal System Occupation Decimal System Decimal System Occupation Patent Administration Patent Secrecy Govt. Patent Board Govt. Patent Board Govt. Patent Board Decimal System Decimal System Decimal System Occupation Decimal System Cable Decimal System Decimal System Cable Decimal System Cable Commodity Standards Calcium Arsenate Calcium Arsenate	25,000 25,000 25,000 25,000 26,500,900 (annually) 2,700,000 10,000,000	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Commerce Foreign Affairs Education Ways & Means Judiciary Postal Territories Agriculture Agriculture Agriculture Agriculture Agriculture Agriculture	Senate Calendar Senate Calendar Senate Calendar In Committee
7710 T. Res. 121 R. 7498 1679 R. 6069 I. Res. 78 R. 6871 R. 6645 100 R. 10 R. 5942 1070 R. 3240 R. 5790 12388 12387 R. 7310 1722 R. 5790 123 Res. 178 R. 6870 R. 6720 J. Res. 178 R. 68870 R. 6987 R. 4830 R. 8984 J. Res. 38 I. Res. 60 J. Res. 30 J. Res. 38 I. Res. 60 J. Res. 20 J. Res. 38 I. Res. 60 J. Res. 38 I. Res. 60 J. Res. 20 J. Res. 2	Jones (R., Vash.) Joini (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D., Suthérland (R., Alaska) Clarke (R., N. Y.) Huddleston (D., Ala.) Brand (D., Ga.) Brand (D., Ga.) Brand (D., Ga.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Exposition Engineering Exposition Forest Lands Officials Forest Lands Commodity Standards Calcium Arsenate Calcium Arsenate	25,000 25,000 25,000 25,000 25,600,000 1,490,000 (annually)	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee
2710 1. Res. 121 R. 7498 2679 R. 6069 J. Res. 78 R. 6871 R. 6645 100 R. 100 R. 101 R. 5942 2070 R. 3240 R. 4465 Res. 102 R. 5790 2388 2387 1722 J. Res. 78 R. 7310 1722 J. Res. 78 R. 7970 R. 7959 R. 6720 J. Res. 178 R. 6870 R. 6870 R. 6870 R. 6870 R. 6830 R. 8984 J. Res. 38 J. Res. 38 J. Res. 30 J. Res. 30 J. Res. 30	Jones (R., Wash.) Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Dial (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utah) Graham (R., Pa.) Green (R., Jowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utah) King (D., Utah) Vestal (R., Ind.) Shipstead (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Ernst (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Jowa) Wolff (D., Mo.) Christopherson (R., S. D., Suthérland (R., Alaska) Clarke (R., N. Y.) Huddleston (D., Ala.) Brand (D., Ga.) Harris (D., Ga.) Harris (D., Ga.) Brand (D., Ga.) Gan. (Amend't.) Harris (D., Ga.)	Raw Material Exports Prademarks Prademarks Mark Cost of Goods Prade Conference Corrupt Practices Industrial Alcohol Metric System Decimal System Decimal System Decimal System Decimal System Paterial System Paterial Roystem Weights Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Govt Patent Board Govt Patent Board Facific Cable Engineering Exposition Engineering Experiments Soldier Bonus Defrauding Govt Protect Property Alaskan Officials Forest Lands Commodity Standards Calcium Arsenate Calcium Arsenate Calcium Arsenate Calcium Arsenate	25,000 25,000,000 25,000 26,500,000 1,490,000 (annually) 2,700,000 10,000,000 10,000,000	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage Coinage Coinage Coinage Coinage Patents Commerce Foreign Affairs Education Ways & Means Judiciary Postal Territories Agriculture Agriculture Agriculture Agriculture Agriculture None	Senate Calendar Senate Calendar Senate Calendar Senate Calendar In Committee
7710 1. Res. 121 R. 7498 1679 R. 6069 R. 6069 R. 6069 R. 6871 R. 6645 100 R. 10 R. 5942 2070 R. 3240 R. 5442 2070 R. 3240 R. 4465 Res. 102 R. 5790 2388 2387 R. 7310 1722 J. Res. 56 R. 9770 R. 7959 R. 6720 J. Res. 178 R. 6887 R. 6897 R. 6897 R. 6897 R. 6897 R. 6947 R. 4830 R. 8984 J. Res. 68 J. Res. 68 J. Res. 68	Jones (R., Vash.) Joini (D., S. C.) Joini (D., S. C.) Joini (D., S. C.) Lowrey (D., Miss.) Ernst (R., Ky.) Fulbright (D., Mo.) King (D., Utsh) Graham (R., Pa.) Green (R., Iowa) Ladd (R., N. D.) Britten (R., Ill.) Colton (R., Utsh) King (D., Utsh) King (D., Utsh) Vestal (R., Ind.) Vestal (R., Ind.) Vestal (R., Ind.) Shipstead (FL., Minn.) Cramton (R., Mich.) Ernst (R., Ky.) Ernst (R., Ky.) Lampert (R., Mich.) Jones (R., Wash.) Pepper (R., Pa.) Upshaw (D., Ga.) Green (R., Iowa) Wolff (D., Mo.) Christopherson (R., S. D.) Suthérland (R., Alaska) Clarke (R., N. Y.) Huddleston (D., Ala.) Brand (D., Ga.) Brand (D., Ga.) Harris (D., Ga.) Brand (D., Ga.) Harris (D., Ga.) Amend't.) Harris (D., Ga.)	Raw Material Exports Trademarks Mark Cost of Goods Trade Conference Corrupt Practices Industrial Alcohol Metric System Metric System Metric System Decimal System Decimal System Weights Weights Weights Weights Weights Weights Patent Inquiry Patent Administration Patent Secrecy Govt Patent Board Pacific Cable Engineering Exposition Engineering Exposition Engineering Exposition Engineering Exposition Forest Lands Officials Forest Lands Commodity Standards Calcium Arsenate Calcium Arsenate	25,000 25,000 25,000 25,000 25,600,000 1,490,000 (annually)	Agriculture Agriculture Agriculture Agriculture Patents Agriculture None Judiciary Ways & Means Manufactures Coinage	Senate Calendar Senate Calendar Senate Calendar In Committee

No.	Introduced by	Object	Appropriation	Committee Reference	Etatus
U D 510	M-Wt- (F) ***		DEVELOPMENT		
H. R. 518 H. R. 6300 \	McKenzie (R., Ill.)	Muscle Shoals Lease	\$3,472,487	Military	Passed House; on Senat Calendar
H. R. 6781	Hull (R., Iowa)	Muscle Shoals Lease		Military	In Committee
S. J. Res. 12 S. 727	Johnson (R., Calif.)	Muscle Shoals Lease	70,000,000	Agriculture	In Committee
H. R. 2903	Swing (R., Calif.)	Colorado River. Colorado River. Columbia River. Fed. Chem. Corp.	70,000,000	Public Lands	In Committee
H. R. 9674 H. R. 9458	Watkins (D., Ore.)	Colorado River	500,000	Int. Commerce	n Committee
3. 2372	Norris (R., Nebr.)	Fed. Chem. Corp		Agriculture	In H. R. 518: on Senat
3. 8214	Norris (R., Nebr.)	Fed. Chem. Corp		Agriculture	Calendar In H. R. 518 on Senat
I. R. 7761	Schneider (R. Wis.)	Fed Chem Corn		Military	Calendar
. 2747	Wadsworth (R., N. Y.)	Fed. Chem. Corp		Agriculture. Military.	In Committee
I. R. 7562 3. 2790	Norris (R., Nebr.)	Power Corp	500,000,000	Military	In Committee
I. R. 7789 J. 2886	Keller (R., Minn.)	Public Power Corp	500,000,000	Int. Commerce	····In Committee
. 3328	Ransdell (D. La.)	Waterpower Development Electrical Development		Commerce	In Committee
	, , , , , , , , , , , , , , , , , , , ,		RTATION—RAI		In Committee
R. 2699 R. 2700	McLaughlin (R., Nebr.)	Repeal Commerce Acta		Int. Commerce	In Committee
R. 4797	Shallenberger (D., Neb.).	Repeal Transportation Act Repeal Transportation Act Amend Transportation Act Amend Transportation Act	** *********	Int. Commerce	In Committee
. R. 8052	Capper (R. Kans.)	Repeal Transportation Act	** ********	Int. Commerce	In Committee
90 745	Brookhart (R., Iowa)	Amend Transportation Act		Int. Commerce	In Committee
1919				Int. Commerce	in Committee
R. 5718 R. 2698	Graham (R., Ill.) (resigned	d). Repeal Section 15A	** ********	Int. Commerce	In Committee
R. 719 R. 79	Brand (D., Ga.)	State Rates		Int. Commerce	in Committee
. R. 688				int. Commerce	In Committee
R. 689		Regional Commissions		Int. Commerce	
1899 J. Res. 94	Hoch (R., Kans.)	Rate Revision		Int. Commerce	Passed House
J. Res. 141	Hoch (D Wome)	Pata Panisis		Int. Commerce	Passed House
J. Res. 107 3070	Howell (R., Nebr.)	Rate Revision Rate Revision Rate Revision Rate Reduction Rate Making		Int. Commerce	In Conference
R. 5427	Huddleston (D., Ala.)	Rate Reduction		Int. Commerce	In Committee
R. 7820 Res. 199	Dill (D., Wash.)	Rate Making Inquiry	** ********	Int. Commerce	In Committee
Res. 199 1371	Reed (R., Pa.)	Railroad Contracts		Judiciary	in Committee
2224 1989	Dill (D., Wash.)	Rate Making Inquiry. Railroad Contracts Railroad Construction Railroad Construction		Int. Commerce	ln Committee
2982 R. 7462	Pittman (D., Nev.)	Railroad Construction	** *********	Int. Commerce	ın Committee
R. 7462		Railroad Construction		Int. Commerce	n Committee
R. 6074	Wolff (D., Mo.)	Interchangeable Miléage		Int. Commerce.	n Committee
1499 R. 9244	Harger (Sec. Wis.)	Steel Cars		Int. Commerce.	A BERFG Senate
2327	Gooding (R., Idaho)	Long and Short Haul			Committee
		Com Combine Manual Comments		Int. Commerce	b nate Calendar
R. 9173	Griest (R., Pa.)	Car Service Explosives Transportation	**	Int. Commerce	n Committee
. R. 7822 . R. 8917	Sproul (R., Kans.)	Long and Short Haul Car Service Explosives Transportation Acid Transportation	*************	Int. Commerce	n Committee
. R. 7822 . R. 8917	Sproul (R., Kans.)	Acid Transportation	** ********	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce.	n Committee
. R. 7822 . R. 8917 3112	repper (R., ra.)	TRANSPOR'	TATION-WAT	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. ER	n CommitteeIn CommitteeIn CommitteeIn Committee
. R. 7822 . R. 8917 3112	Ransdell (D., La.)	TRANSPOR'Inland Waterways Corporatio	TATION—WAT 5,000,000 5,000,000	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. ER Commerce.	
R. 7822 R. 8917 3112 1559 2415 R. 8209	Ransdell (D., La.) Ransdell (D., La.) Denison (R., Ill.)	TRANSPOR	TATION—WAT 5,000,000 5,000,000 5,000,000	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. ER Commerce. Commerce. Int. Commerce. Int. Commerce.	
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161	Ransdell (D., La.) Ransdell (D., La.) Denison (R., Ill.)	TRANSPOR	FATION—WAT 5,000,000 5,000,000 5,000,000	Int. Commerce. Commerce. Commerce. The Commerce. Commerce. Flood Control	n Committeeln Committeeln Committeeln Committeeln Committeeln Committeen Committeen Committeen Committeen Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2	Ransdell (D., La.) Ransdell (D., La.) Denison (R., Ill.)	TRANSPOR	FATION—WAT 5,000,000 5,000,000 5,000,000	Int. Commerce. Commerce. Commerce. The Commerce. Commerce. Flood Control	n Committeeln Committeeln Committeeln Committeeln Committeeln Committeen Committeen Committeen Committeen Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822	Ransdell (D., La.)	TRANSPOR. Inland Waterways Corporatio Lakes to Gulf Lakes to Hudon	TATION—WAT a. 5,000,000 a. 5,000,000 a. 5,000,000 a. 5,000,000 c. 250,000 5,700,000	Int. Commerce. Commerce. Commerce. The Control Expenditures. River & Harbor	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5560 R. 504	Ransdell (D., La.)	TRANSPOR. Inland Waterways Corporatio Lakes to Gulf Lakes to Hudon	TATION—WAT a. 5,000,000 a. 5,000,000 a. 5,000,000 a. 5,000,000 c. 250,000 5,700,000	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Flood Control Expenditures. River & Harbor Judiciary. River & Harbor	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5560 R. 504	Ransdell (D., La.)	TRANSPOR. Inland Waterways Corporatio Lakes to Gulf Lakes to Hudson Ohio River Obio Miss. Mo. Waterway	5,000,000 5,000,000 5,000,000 5,000,000 5,000,000 5,700,000 45,000,000	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Commerce. Int. Commerce. Int. Commerce. Flood Control Expenditures River & Harbor Judiciary River & Harbor Commerce. River & Harbor	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5660 R. 3938 41	Ransdell (D., La.)	TRANSPOR. Inland Waterways Corporatio Lakes to Gulf Lakes to Hudson Ohio River Obio Miss. Mo. Waterway	5,000,000 5,000,000 5,000,000 5,000,000 5,000,000 5,700,000 45,000,000	Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Flood Control Expenditures. River & Harbor Judiciary. River & Harbor Commerce. Int. Commerce. Int. Commerce.	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5640 R. 504 1436 R. 3933 41	Ransdell (D., La.) Kansdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) (deceased McCormick (R., Ill.) Rainey (D., Ill.) Reed (R., N. Y.) Relly (R., Pa.) Beed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Mas.)	TRANSPOR Inland Waterways Corporatio I. Waterways Commission Lakes to Gulf. Lakes to Gulf. Lakes to Hudson Ohio River Ohio-MissMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$250,000 5,700,000 45,000,000 c. \$3,000,000 c. \$1,500,000 c	Int. Commerce. Flood Control Expenditures. River & Harbor Judiciary. River & Harbor Commerce. Int. Commerce. Commerce. Int. Commerce. Int. Commerce.	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5690 R. 504 1436 R. 3933 41 R. 6636 R. 5080 2717	Ransdell (D., La.) Kansdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) (deceased McCormick (R., Ill.) Rainey (D., Ill.) Reed (R., N. Y.) Relly (R., Pa.) Beed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Mas.)	TRANSPOR Inland Waterways Corporatio I. Waterways Commission Lakes to Gulf. Lakes to Gulf. Lakes to Hudson Ohio River Ohio-MissMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$250,000 5,700,000 45,000,000 c. \$3,000,000 c. \$1,500,000 c	Int. Commerce. Flood Control Expenditures. River & Harbor Judiciary. River & Harbor Commerce. Int. Commerce. In	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 6822 R. 5660 R. 504 1436 R. 3333 41 R. 6636 R. 5080 2717 22555	Ransdell (D., La.) Kansdell (D., La.) Kansdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) (deceased M. Cormick (R., Ill.) Rainey (D., Ill.) Rainey (D., Ill.) Reed (B., N. Y.) Kelly (R., Pa.) Beed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Walsh (D., Mass.) Walsh (D., Mass.)	TRANSPOR Inland Waterways Corporatio I. Waterways Commission Lakes to Gulf. Lakes to Gulf. Lakes to Gulf. Ohio River Ohio-MissMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shinning	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$250,000 5,700,000 45,000,000 c. \$3,000,000 c. \$1,500,000 c	Int. Commerce. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Flood Control Expenditures River & Harbor Judiciary River & Harbor Commerce. Int. Commerce. Int. Commerce. Int. Commerce. Commerce. Int. Commerce. Commerce. Marine. Commerce. Commerce. Commerce. Marine.	n Committee In Committee
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R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6862 R. 5660 R. 504 1436 R. 3933 41 1436 R. 3933 41 1545 R. 7181 1545 R. 7181	Ransdell (D., La.) Ransdell (D., La.) Ransdell (D., La.) Denison (R., Ill.) Ransdell (D., La.) Lupre (D., La.) Lupre (D., La.) Rainey (D., Ill.) Red (R., N. Y.) Kelly (R., Pa.) Red (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Wish (D., Mass.) Sutherland (R., Alaska) King (D., Utah) Greene (R., Mass.)	TRANSPOR Inland Waterways Corporatio I. Waterways Commission Lakes to Gulf Lakes to Gulf Lakes to Hudson Ohio River Ohio-MissMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shipping Steamship Regulation Shipping Rates Merchant Fleet	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$260,000 5,700,000 45,000,000 c. \$3,000,000 c. \$1,500,000 c. \$100,000	Int. Commerce. Commerce. Int. Commer	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6622 R. 5640 1436 R. 3933 41 1436 R. 5636 R. 5080 2717 2555 R. 7181 1545	Ransdell (D., La.) Ransdell (D., La.) Ransdell (D., La.) Denison (R., Ill.) Ransdell (D., La.) Lupre (D., La.) Lupre (D., La.) Rainey (D., Ill.) Red (R., N. Y.) Kelly (R., Pa.) Red (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Wish (D., Mass.) Sutherland (R., Alaska) King (D., Utah) Greene (R., Mass.)	TRANSPOR Inland Waterways Corporatio I. Waterways Commission Lakes to Gulf. Lakes to Gulf. Lakes to Gulf. Ohio River Ohio-MissMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shinning	5,000,000 5,000,000 5,000,000 5,000,000	Int. Commerce. Commerce. Commerce. Flood Control Expenditures. River & Harbor Judiciary. River & Harbor Commerce. Int. Commerce. Marine. Commerce. Marine. Commerce. Marine. Commerce. Marine. Commerce. Marine. Commerce. Marine. Commerce.	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5560 R. 504 1436 R. 393 R. 5686 R. 5	Ransdell (D., La.) Ransdell (D., La.) Ransdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) Rainey (D., Ill.) Rainey (D., Ill.) Reed (R., N. Y.) Relly (R., Pa.) Reed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Walsh (D., Mass.) Edge (R., N. J.) Sutherland (R., Alaska) King (D., Utah) Greene (R., Mass.) Edmonds (R., Pa.) Willis (R., Ohio)	TRANSPOR Inland Waterways Corporatio Lakes to Gulf. Lakes to Gulf. Lakes to Gulf. Lakes to Hudson Ohio River Ohio-NilssMo. Waterway Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shipping Steamship Regulation Shipping Rates Merchant Fleet Merchant Fleet Anti Aream Pollution	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 b. \$250,000 5,700,000 45,000,000 11,500,000 11,500,000 100,000 50,000,000 50,000,000 50,000,000 50,000,00	Int. Commerce. Commerce. Int. Commerce. Int. Commerce. Flood Control Expenditures River & Harbor Judiciary River & Harbor Judiciary River & Harbor Commerce. Int. Commerce Int. Commerce Int. Commerce Commerce. Commerce. Commerce. Marine.	n Committee In Committee
R. 7822 R. 8917 3112 1559 2415 R. 8209 3161 R. 484 Con. Res. 2 R. 6822 R. 5560 R. 594 1436 R. 3933 R. 5680 2717 R. 5680 2717 R. 5680 R. 5680 R	Ransdell (D., La.) Ransdell (D., La.) Ransdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) Lupre (D., La.) Lupre (D., La.) Lupre (D., Ill.) Reed (B., N. Y.) Reed (B., N. Y.) Reed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Walsh (D., Mass.) Sutherland (R., Alaska) King (D., Utah) Greene (R., Mass.) Edmonds (R., Pa.)	TRANSPOR Inland Waterways Corporatio Lakes to Guif Lakes to Guif Lakes to Guif Cake Corporatio Inland Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shipping Steamship Regulation Shipping Rates Merchant Fleet Merchant Fleet Anti-stream Pollution Anti-stream Pollution	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$5,000,000 c. \$5,000,000 c. \$45,000,000 c. \$1,500,000 c. \$11,500,000 c. \$100,000 c.	Int. Commerce. Int. C	n Committee In Committee Law
R. 7822 R. 8917 3112 2415 2415 3161 R. 484 Con. Res. 2 R. 6822 R. 6822 R. 5640 R. 3933 41 R. 5636 R. 5940 1436 R. 5980 2717 28. 7181 1545 R. 5948	Ransdell (D., La.) Ransdell (D., La.) Ransdell (D., La.) Denison (R. Ill.) Ransdell (D., La.) Lupre (D., La.) Lupre (D., La.) Lupre (D., La.) Lupre (D., Ill.) Reed (B., N. Y.) Reed (B., N. Y.) Reed (D., Mo.) Winslow (R., Mass.) Lodge (R., Mass.) Mapes (R., Mich.) Edmonds (R., Pa.) Walsh (D., Mass.) Sutherland (R., Alaska) King (D., Utah) Greene (R., Mass.) Edmonds (R., Pa.)	TRANSPOR Inland Waterways Corporatio Lakes to Guif Lakes to Guif Lakes to Guif Cake Corporatio Inland Cape Cod Canal Cape Cod Canal St. Lawrence Canal Ocean Transportation Marine Bureau Government Shipping Steamship Regulation Shipping Rates Merchant Fleet Merchant Fleet Anti-stream Pollution Anti-stream Pollution	TATION—WAT a. \$,000,000 a. \$,000,000 a. \$,000,000 a. \$,000,000 c. \$5,000,000 c. \$5,000,000 c. \$45,000,000 c. \$1,500,000 c. \$11,500,000 c. \$100,000 c.	Int. Commerce. Commerce. Int. Commer	n Committee In Committee
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lo.	Introduced by	Object	Appropriatio	m Committee Reference	Status
			TARIFF		
R. 9316 R. 6886	James (R., Mich.)	Copper Duty Oil Duty Coal Car Duties Wire Duty Table Utensils Foreign Carriers 5 Percent Reduction Exchange of Products Exchange of Products Exchange of Products Tariff Inquiry Tariff Inquiry Free Wire Rods Free Ammonium Sulp		. Ways & Means	In Committee
R. 7791	Frear (R., Wis.)	Coal Car Duties		Wave & Mosms	
R. 9455	Canfield (D., Ind.)	Wire Duty	********		In Committee
R. 8635 R. 3911	Howard (D., Neb.)	Table Utensils	********	Ways & Means	In Committee
82 435	Jones (R., Wash.)	5 Percent Reduction	********	Finance	In Committee
435	Fletcher (D., Fla.)	Exchange of Products		Finance. Ways & Means. Ways & Means. Finance.	In Committee
J. Res. 284 J. Res. 289	Rankin (D., Miss.)	Exchange of Products		Ways & Means	In Committee
47	Jones (D., N. M.)	Tariff Inquiry	\$1,000,00	00 Finance	In Committee
490	Walsh (D., Mass.)	Tariff Inquiry	396,00	00 Appropriations	In Committee
483 R. 8463	Gooding (M., Idaho)	Free Wire Rods	hate	Appropriations	In Committee
R. 476	C : (D G)	Free Ammonium Suip	hate		
3. 4822	Crisp (D., Gal)	Free Calcium Arsenat	Bearress		
59 90	George (D. Ga.)	Free Calcium Arsenate		Finance	In Committee
2, 629	Black (D., Texas)	Free Calcium Arsenate			In Committee
2. 611	Wilson (D., La.)	Free Calcium Arsenate		Ways & Means	In Committee
R. 464 R. 583	Vinson (D., Ga.)	Free Calcium Arsenate			In Committee
2. 2866	Stevenson (D., S. C.)	Free Calcium Arsenate	B	Ways & Means	In Committee
3. 482	Almon (D., Ala.)	Free Calcium Arsenat	B	Ways & Means	In Committee
R. 4106 R. 4974	McClintic (D. Okla)	Free Calcium Arsenat		Ways & Means	In Committee
	meetinie (D., Onim).	Pree Calcium Aisenau		Ways & Means	In Committee
T 70 - 05	P (P M)	0 1 0	WAR CONTROL		
I. Res. 85 I. Res. 76	Johnson (R., S. D.)	Conscript Property. Conscript Property. Conscript Property. Conscript Property. Conscript Resources. Conscription. Conscription Inquiry. War Profit Regulatio. War Profit Regulatio. Price Regulation. Price Control.			In Committee
R. 194	French (R., Idaho)	Conscript Property	*********	MILITARY	in Committee
Con. Res. 1 R. 4841	Lohnson (B. Lowa).	Conscript Property		Rules	
I. Res. 271	Taber (R., N. Y.)	Conscript Resources	***********	Judiciary	In Committee
. Res. 285	Snell (R., N. Y.)	Conscription Inquiry.	***********	Rules	House Calendar
. 5232 . Res. 128	McSwain (D., S. C.)	War Profit Regulation	a	Judiciary	n Committee
les. 101	Borah (R., Idaho)	War Profit Regulation	A		
2. 517	McKenzie (R., Ill.)	Price Regulation		Military	House Calendar
561 Res. 183	Capper (R., Kans.)	Price Control		MILITARY	In Committee
Res. 265	La Guardia (R., N. Y.) War Profits		Foreign Affaira	In Committee
Res. 266	Thomas (D., Okla.)	War Profits		Judiciary	In Committee
927	McKeller (D., Tenn.).	Government Contract		Judfeiary	In Committee
			LABOR		
89 R. 9298	Spencer (R., Mo.)	Conciliation Court Adjustment Labor Di Labor Injunctions. h.) Injunction Restriction Injunction Restriction Unemployment Comm		Judiciary	In Committee
R. 3208	Thomas (D. Kv.)	Labor Injunctions.	sputes		In Committee
760	Shipstead (FL., Minr.	.) Injunction Restriction		Judiciary	In Committee
R. 8663	Wefald (FL., Minn.)	Injunction Restriction	ission 100,0	Judiciary	In Committee
R. 5338	Copeland (D., N. 1.).	Onemployment Comm	1881On 100,0		
R. 7698	Wolff (D., Mo.)	Strikebreakers			
983 3218	Jones (R. Wash)	Anti-Sunday Labor in	D C		In Committee
Res. 202	Ashurst (D., Ariz.)	Seditious Acts	D. C		Senate Calendar
R. 4798	Shallenberger I.D., Nei	br. i Aboush Rd. Labor D	MAPOL	Int. Commerce	In Committee
R. 30 R. 89	MacGregor (R. N. V.	Abolish Rd. Labor B	pard		In Committee
R. 171	Tincher (R., Kans.)	Abolish Rd. Labor Bo	ard	Int. Commerce	In Committee
)20 R. 520	King (D., Utah)	Abolish Rd. Labor Bo	ard	Int. Commerce	In Committee
R. 7358	Rarkley (D. Kv.)	Abolish Rd. Labor Bo Abolish Rd. Labor Bo Abolish Rd. Labor Bo Railroad Labor Dispu Railroad Labor Dispu Labor Disputs Settler	ites 500,	Int. Commerce	House Calendar
2646	Howell (R., Neb.)	Railroad Labor Dispu	ites 500,	000 Int. Commerce	Senate Calendar
R. 9009 R. 4809	Coopes (26., Onio)	Dabot Dispute Dettier	mcme		In Committee
Res. 176	Zihlman (R., Md.)	Report on Convict La	bor		
D CODE	Zihlman (D. Md)	Mark Convict Labor	Coods	Labor	In Committee
3482 P 9491	Fess (R., Ohio)	Convict Labor		Int. Commerce	In Committee
J. Res. 184	Foster (R., Ohio)	Convict Labor			Law
other rese	olutions of similar impo	ort were introduced in Hou	se and Senate.)		
			IMMIGRATION	3	
R. 7995	Johnson (R., Wash.).	2 Percent Restriction		Immigration	Law
R. 101 R. 6540	Johnson (R., Wash.).	Immigration Restrict	ion		In Committee
R. 6540 R. 461	Sabath (D., Ill.)	Immigration RestrictImmigration RestrictImmigration Restrict	ion	Immigration	In Committee
E 589				Immigration	In Committee
R. 539 R. 622	Pearlman (R. N. V.)	Admit 500,000 Alien Repeal Restriction A Limit Immigration Literacy Test Exclude Undesirables	t		In Committee
R. 622 R. 5 R. 4471	Raker (D., Calif.)	Limit Immigration.		Immigration	In Committee
R. 4471 R. 5322	Raker (D., Calif.)	Literacy Test		Immigration	In Committee
R. 3197	Steagall (D. A	Suspend Immigration	10 Years		n Committee
R. 4466	Romjue (D., Mo.)	Suspend Immigration Suspend Immigration Suspend Immigration Suspend Immigration Suspend Immigration Lipid Immigration Alien Deportation Alien Deportation	6 Years	Immigration	In Committee
R. 6067 J. Res. 50	Wilson (D., Miss.)	Suspend Immigration	6 Years	Immigration	In Committee
R. 5320	McReynolds (D. Ten	n.)Suspend Immigration	5 Years	Immigration	In Committee
R. 5079	Edmonds (R., Pa.)	Alien Deportation	500,	,600 Immigration	In Committee
R. 5418	Cable (R., Ohio)	Alien Deportation		Immigration	In Committee
R. 4089 R. 6247	Cable (R. Ohio)	J3 Percent Restrictio	n	,000 Immigration	In Committee
R. 4098	Box (D., Texas)	2 Percent Restriction	1	Immigration	In Committee
R. 3239	Vestal (R., Ind.)	2 Percent Restriction		Immigration	In Committee
2365 R. 7684 R. 7919	Aswell (D. La.)	2 Percent Restriction	1	Immigration	In Committee
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2576	Reed (R., Pa.)	I Percent Restrictio	n		Committee
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SILVER PRODUCERS' CONFERENCE

Meeting Silver Producers Salt Lake City—American Silver Producers' Association Organized—Synopsis Of Address—Resolutions Adopted

By A. G. MACKENZIE*

ORE than 90 percent of the domestic silver production of 1923, in addition to representation from Mexico and Canada, was represented at the Silver Producers' Conference in Salt Lake City, August 6, 7 and 8. All the western silver producing states had delegates in attendance. The official registration list shows more than one hundred producers in attendance in addition to others interested.

At the first session of the conference the delegates were welcomed to Salt Lake City by Mayor C. Clarence Neslen, and addresses were made by Chairman W. Mont Ferry, Senator Reed Smoot of Utah, Senator Tasker L. Oddie of Nevada, chairman of the Senate Commission of Gold and Silver Inquiry; former Senator C. S. Thomas of Colorado, and Secretary James F. Callbreath of the American Mining Congress.

Senator Oddie recommended appointment of a committee by silver producers to represent the industry in investigating the possibilities of currency reform in China and the extent to which American silver producers might participate therein. He recommended that silver producers and fabricators match government funds for investigation of new uses of silver.

"Return to the gold standard in foreign countries is as important to producers of silver in reestablishing normal silver currency conditions as it is to gold producers in maintaining the monetary position of gold," said the Senator, who referred to the fact that opposition has been expressed in Europe to a return to the gold standard.

Senator Oddie referred to the increasing importance of New York and San Francisco as markets for silver and the need for establishing in this country open market conditions on a basis comparable with those of London. He said that should legal interpretation of the Webb-Pomerene act indicate that amendments are necessary to permit producers of silver to establish in New York and San Francisco satisfactory market conditions to compete with London as a silver market the commission will consider urging enactment of such legislation. "There never has been a time in the history of the gold and silver mining industry when the need for a permanent organization has been more necessary than now, as there are many problems which can be solved in no other way," Senator Oddie concluded. "From the standpoint of legislation the commission is ready to consider the needs of the industry."

Senator Thomas severely arraigned the Treasury Department's administration of the Pittman act in the course of an address on legal phases of the silver situation. He said it was the shipment of American silver derived from American dollars melted under the Pittman act and sent to the Orient that beat the price down from \$1.40 to 82 cents.

Senator Smoot urged organization of the producers, and Mr. Callbreath, in the course of an address urging organization, briefly reviewed the circumstances that led to the recent sale of 6,000,000 ounces of silver for coinage to Poland.

The report of the committee on permanent organization and the answer of the Federal Trade Commission to queries propounded by the silver producers were submitted at this session.

Gov. Charles R. Mabey of Utah formally welcomed the delegates on behalf of the state at the opening of the second day's session.

C. F. Kelley, president of the Anaconda Copper Mining Company and chairman of the Fact Finding Committee, created at the Reno silver conference last September, presented the report of his committee. He said the silver industry is on the verge of a very splendid situation, with foreign quotations stronger than at any time in the last four years. He alluded to the resumption or initiation of silver coinage in European countries which he said means that silver is coming into its own as never before.

Mr. Kelley said it would be premature to advise definitely the formation of a silver export association until the situation had been further considered. He recommended that the producers, smelters and refiners should unite in a permanent organization so that matters of common interest could be properly considered and financed.

Mr. Callbreath, Secretary of the American Mining Congress, pledged his support to the silver organization and promised the cooperation of the American Mining Congress. Mr. Callbreath also alluded to the fact that the present movement originated at the Cleveland convention of the American Mining Congress and expressed the hope that the two organizations would work together harmoniously for the common good.

Mr. Kelley followed Mr. Callbreath with the following tribute to Mr. Callbreath's work:

"Under the circumstances it pleases me particularly to express my personal admiration for the work of a man who has worked early and late, who has overcome tremendous obstacles under the most discouraging conditions, who throws himself into any undertaking for the good of the mining industry with almost the zeal of a crusader. I refer to Secretary Callbreath of the American Mining Congress. In the days of tribulation of the organization, it was he who went down in his own pocket and got the money to carry on the activities of the Congress. The organization has been his life work. He has accomplished inestimable services for the mining industry."

F. H. Brownell, vice-president of the American Smelting & Refining Company, outlined the procedure and the difficulties of marketing American silver among foreign governments. He pledged the full cooperation of his company to the organization, as did all the other representatives present.

The report of the committee on permanent organization was then adopted and the association formally initiated after many of those present had pledged their full support to the new organization.

The third day's session was short. It was devoted to informal discussion of details of operation.

PRODUCERS ORGANIZE

The important outcome of the meeting was the formal organization of the American Silver Producers' Association, with the following officers and directors:

President, W. Mont Ferry, Utah; first vice-president, F. M. Smith, Washington; second vice-president, Charles Bocking, Montana; secretary-treasurer, Henry M. Rives, Nevada.

Board of Directors: W. Mont Ferry, Utah; E. J. Raddatz, Utah; F. Y. Robertson, at large; L. O. Evans, Montana; Charles Bocking, Montana; A. M. Morris, Arizona; Alfred Harrell, California; John G. Kirchen, Nevada; Clyde A. Heller, Nevada; F. M. Smith, Washington; Jesse McDonald, Colorado; Jerome J. Day, Idaho; R. E. Tally, at large; C. F. Kelley, at large; F. H. Brownell, at large.

Executive Committee: W. Mont Ferry, C. F. Kelley, John G. Kirchen, F. H. Brownell, F. M. Smith, F. Y. Robertson, R. E. Tally.

The association is formed to "advise, aid and support legislation and other procedure looking to the lowering of cost of production, reduction and transportation of silver and the orderly marketing

^{*}Secretary, Utah Chapter, The American Mining Congress.

of the same, the elimination of discrimination against the industry, and to subserve, promote and protect the interests of all those engaged in the production of silver in the United States and elsewhere and in that behalf to prosecute any and all lines of activity which may subserve and promote the welfare of the silver mining industry and those engaged therein." All individuals and concerns interested in the production of silver on the American continent are eligible to membership. The membership fee is fixed at \$10. Producers of silver are subject to dues not in excess of one-tenth of one cent per ounce per annum

of silver produced. Smelting or reducing members are subject to such dues on a basis not in excess of 25 percent of the total quantity of silver reduced or refined. Voting is on the basis of one vote for each \$5 paid in dues during the preceding year. The annual meeting is to be held on the second Monday of October in each year. Salt Lake City, Utah, is named as the princi-

pal office of the association, and the board of directors is empowered to establish branch offices elsewhere.

Arrangements for the meeting and the entertainment of the delegates were made by committees of the Utah Chapter, American Mining Congress. The program included a luncheon to the delegates tendered by the Chamber of Commerce of Salt Lake City, a drive about the city, a dinner tendered by the Bonneville Club of Salt Lake City, at which Senator Thomas, Senator Oddie and Mr. Brownell were speakers, and a trip to the Utah Copper Mine at Bingham, the reduction plants at Magna, the plant of the Garfield Smelting Company and to the Saltair pavilion at the Lake. A luncheon was served at the new hotel of the United States Smelting, Refining & Mining Company at Bingham and dinner was served in the cafe at the Saltair pavilion. Visiting ladies were entertained by the Ladies' Auxiliary, Utah Section, A. I. M. & M. E.

After the close of the meeting many of the delegates were guests of Utah mine operators on visits of inspection to Bingham, Park City, Tintic and other mining camps of the state.

Articles of the association are as

ARTICLES OF ASSOCIATION ARTICLE I

The name of this association is American Silver Producers' Association.

ARTICLE II

The purpose of the association is to "advise, aid and support legislation and other procedure looking to the lowering of cost of production, reduction and transportation of silver and the orderly marketing of the same, the elimination of discrimination against the industry, and to subserve, promote and protect the interests of all those engaged in the production of silver in the United States and elsewhere and in that behalf to prosecute any and all lines of activity which may subserve and promote the welfare of the silver mining industry and those engaged therein."



Daly West Mine, Utah Boutwell, U. S. Geological Survey

ARTICLE III

All persons, co-partnerships and corporations engaged in the production, reduction or refining of silver or prospecting for the same, or otherwise interested therein, on the American continent are eligible to membership in the association, and may be so admitted upon the terms and conditions hereinafter set forth. Of these there shall be two classes, (a) producers, (b) non-producers. There shall be a membership fee of ten dollars (\$10). An applicant for membership shall apply to the association through its secretary and shall communicate such facts as the board of directors may prescribe, including estimated annual production of silver, and if a corporation, the name of a representative who shall represent it in the association. The application shall be accompanied by the required entrance fee. Thereafter the application shall be referred to the membership committee and, upon approval by that body, the applicant, after having assented to these articles, shall be duly declared elected a member of the association.

ARTICLE IV

The association shall be maintained by dues contributed by its members. Dues of producers shall not exceed one-tenth of one cent per ounce of silver produced in the preceding year and shall not be less than ten dollars (\$10) per annum. In determining the amount of silver produced for the purpose of fixing dues,

smelting or other reducing members except when owners of mines actually producing silver shall be assessed on a basis not to exceed 25 percent of the total quantity of silver reduced or refined during the preceding year. Dues of nonproducers shall not be less than five dollars per annum and the entrance fee covers the first year's dues. The executive committee may levy an assessment upon producing members not exceeding the prescribed annual dues, which action the secretary thereafter 'shall communicate to such members, requesting payment thereof. Members at their election may pay the entire annual dues in one

> payment. In addition to revenue derived from dues, the association may receive subscription from members and others.

ARTICLE V

The officers of the association shall be president, first vice-president, second vice-president, and secretary-treasurer. Said officers shall be elected annually by the board of directors immed.

ately after the annual meeting of the association. The president and vicepresident shall be members of the board of directors.

ARTICLE VI

The president shall preside at all meetings of the association, of the board of directors and of the executive committee. In his absence the first vicepresident shall act in his place; in the absence of the president and first vicepresident the second vice-president shall act. In the absence of all three officers the secretary-treasurer shall call for the election of a temporary chairman who shall preside over the meeting. The secretary-treasurer shall be the executive officer of the association. He shall record the minutes of the association, of the board of directors and of the executive committee. He shall keep all records of the association, shall receive all moneys due the association and shall disburse from the association's treasury such amounts as may be authorized by the executive committee or the board of directors. He shall carry out the instructions of the association, the board of directors and the executive committee and shall perform such other duties as are usually required.

ARTICLE VII

There shall be a board of directors of not more than twenty-three nor less than fifteen members. Until otherwise provided by the board of directors said board shall consist of fifteen members, of which twelve shall be elected by the association annually as hereinafter provided and three additional members shall be chosen by the twelve so elected. Representation on the board shall be based proportionately on the amount of silver produced in the preceding year among the several silver producing states. Until the plan of representation is changed by amendment of these articles, the states of Arizona, California, Colorado, Idaho and Nevada shall each be entitled to one member. The states of Montana and Utah shall each be entitled to two members. Three members at large shall be chosen from any of the silver producing states and countries. The three additional members to be chosen by the twelve elected at the annual meeting shall be selected from among any contributors or subscribers to the funds of the association.

ARTICLE VIII

At annual meetings of the association the voting power of members thereof shall be one vote for each five dollars (\$5) paid in dues during the preceding year. The term of office of officers and directors shall be one year. The directors shall be elected as follows: A nominating committee of ten members shall be appointed by the board of directors whose duties shall be to nominate, at least sixty days before the date of election, three times as many persons as there are directors to be elected. If any nominee shall decline, the executive committee shall fill the vacancy, and failure to seasonably accept shall constitute a declination. Thereupon and at least forty-five days before the day of election the secretary-treasurer shall cause a return postal card to be directed and mailed to each member of the association containing the names of the nominees with directions to vote as many votes as each may be entitled to for the requisite number of persons to be elected directors at the coming election, and the number of persons receiving the highest number of votes shall be declared elected. In the case of a tie vote, the members assembled in annual meeting of each year shall decide the tie, and in case of a challenge as to eligibility the members so assembled shall decide such challenge.

ARTICLE IX

After election the board of directors shall choose from among its members an executive committee of seven, of which the president shall be a member. The executive committee shall have the full power of the board of directors in the transaction of the association's business. The board, however, shall have authority to modify or annul an act of the executive committee by vote of a majority of

the whole board. Three members of the executive committee shall constitute a quorum.

ARTICLE X

The president, first vice-president and second vice-president shall receive no compensation for their services. The secretary-treasurer shall receive such salary as the board of directors or executive committee may determine. The board of directors or the executive committee may employ such assistance as may be deemed necessary and the secretary-treasurer may, with the approval of the executive committee or the board, employ assistance at such compensation as may be authorized by the board or executive committee. All members of the board of directors and the executive committee shall be reimbursed their actual traveling expenses and sustenance in coming to and returning from meetings of either body.

ARTICLE XI

The annual meeting of the association shall be held on the second Monday in October in each year at a place designated by the board of directors. Other meetings of the association may be held at the call of the board. At all meetings forty members shall constitute a quorum. The board of directors shall meet at the call of the president at least two times per year. The executive committee shall meet at the call of the president at a place designated by him at least four times per year. The principal office of the association shall be at Salt Lake City until otherwise prescribed by the board of directors. The board may also establish branch offices in any part of the United States or elsewhere.

ARTICLE XII

During the recesses of the association and at times while the association is not in session the board of directors shall, and it is hereby authorized, empowered and instructed to exercise the whole power of the association. A majority of the board of directors and three members of the executive committee shall constitute a quorum in either body. The affirmative vote of five members of a quorum of the board of directors, if that number is a majority of a quorum, shall be necessary to form any decision or pass upon any question binding upon the association. The affirmative vote of three members of the executive committee, if that number is a majority of a quorum, shall be necessary to form any decision or pass upon any question binding upon the association. The board of directors shall have the power to fill any and all vacancies in its body or of the executive committee. The executive committee shall be the committee on membership. The board of directors may designate and appoint subcommittees from among

its members, the duties of which shall be determined by the board. The executive committee shall be the finance committee of the association and shall have full power to arrange and administer the finances of the association.

ARTICLE XIII

The board of directors may from time to time amend these articles and prescribe any and all further rules for the conduct and government of the association as may, in its judgment, from time to time, appear necessary. Such amendments must be carried by a majority of the full board and shall remain in force until disapproved or rejected at a meeting of the whole association. The association, at any meeting, may amend these articles by a majority vote.

ARTICLE XIV

Each corporate member of the association shall designate a representative who shall be empowered to act for it and vote for it at annual and other meetings of the association and to otherwise represent it in association affairs, otherwise there shall be no voting by proxy.

ARTICLE XV

Any member who is delinquent in dues to the association for a period exceeding six months shall be suspended from the association until such indebtedness is liquidated. Any member delinquent in dues to the association for a period exceeding one year may be expelled by the board of directors or the executive committee.

SILVER EXPORT ASSOCIATION

A silver export association is legal, according to a decision of the Federal Trade Commission. The opinion was rendered by Commissioners Van Fleet, Gaskill and Hunt because "an emergency situation exists in the industry which requires action by the commission." Commissioners Thompson and Nugent dissented but did not give their views.

"It seems to be open under the act for those who desire to form an association under its provisions to file with the commission the declarations referred to in Section 5 of the Webb act," says the opinion, which was written by Commissioner Van Fleet. "Preliminary assent of the commission to export association existence and activity is not required. The action of the commission toward export associations is corrective of action taken rather than a limitation upon entry into action. It is proper that the commission should, when called upon in advance of the formation of an export trade association, indicate that proposed conduct would, when carried into operation, invite corrective attention of the commission. But the commission cannot assume results of an indicated course of conduct. The test of legality lies in results rather than in the form or method pursued. The commission cannot always make a precise statement under these circumstances. Preliminary expression is advisory only, and the silver committee is in no way precluded from asserting any method of coordinate action it believes to be within the intent and spirit of the act. If its views should differ from those of the commission and the results should fall within prohibition of the act, the commission would determine the issues involved."

The commission answers questions of the silver producers' committee as follows:

Does the Webb act limit persons (natural or corporate) who may enter into such association to citizens of the United States or corporations formed under laws of the United States or some state? The commission answers in the affirmative, stating that Congress legislates with reference to its citizens and its sovereignty, and the laws of the United States are applicable to those who are not its citizens and to corporations formed under United States laws. The act, however, does not prevent an association from entering into any cooperative relationship with a foreign corporation for the sole purpose of operating in a foreign market. The test of legality in such an arrangement would be the effect upon domestic conditions in the United States.

Is the export product that may be disposed of by such association limited to productions originating in and exported directly from United States ports, or does it include products originating outside the United States imported into the United States and then exported from United States ports to foreign markets? The commission says the act is silent on this subject, but that in the absence of a contrary indication "export" is assumed to include domestic products only and not imports which form the basis of subsequent exports.

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Is the export product that may be disposed of by such association limited to a product shipped from the United States or may it embrace a product of a member of the association produced outside the United States and shipped direct to a foreign port, without first entering the United States? The commission says it is difficult to see how shipments between foreign ports can be regarded as exports from the United States and that such trade would not come under the act.

Can a valid trade agreement be entered into between such association (a) between nationals engaged in producing and exporting commodities outside the United States, but whose product would reach the same foreign market as that

of the association exporting direct from the United States; and (b) non-nationals engaged in producing and exporting commodities outside the United States whose products would reach the same foreign market as products of the association exporting direct from the United States? The commission says the purpose of the act is to provide a method of eliminating competition in foreign markets among domestic producers. It sees no reason why an association composed of nationals or residents of the United States exporting from the United States might not adopt a trade arrangement with nonnationals reaching the same market, provided this market is not the domestic market of the United States and the action of the association does not reflect unlawfully upon domestic conditions. "It does not seem that nationals and nonnationals who are also non-residents might unite within the association," the commission says.

Must an export association perform all operations of selling the product of its members to foreign buyers, or does "commerce" mean that an association complies with the act if it is solely engaged in allotting export orders among its members, fixing prices at which its members shall sell in export trade, or performing any one or more of the other operations comprised in the chain that constitutes selling and export trade under the general trade agreement that deals solely with export trade and as filed with the commission under the act? The commission says the act does not require the association to perform all operations of selling its members' product to foreign buyers. The limitation upon methods of operation is in the phrase "in the course of export." The commission recently passed upon the conduct of an association which does not itself export but which performs a pricefixing function and an allocation of business, selling at the wharf to others than the association who conduct the export movement from that point. The commission holds that the consummation of sale within the United States, if the product is intended and actually enters the export trade, is in the course of export under the act. An association may, without conflicting with the act, allot export orders among its members and fix prices at which members shall sell in the export trade. The law provides two tests: That the conduct shall be in export or in the course of export; and that it shall not be in restraint of trade within the United States, shall not restrain export trade of any domestic competitor, and shall not artificially enhance prices or lessen competition within the United States or otherwise restrain trade therein. Application of the latter test is dependent upon results of conduct

which cannot be forecast at least by the commission. The commission says that papers filed by several associations show actual export and sale in foreign markets is conducted by individual members.

Does the prohibition of the act against affecting domestic commerce extend to and include a consequential rise in price in the domestic market through the better organized control of the foreign markets and the broadening of export trade; or is the prohibition limited to acts which intentionally or directly are committed to advance the domestic price or restrain trade through an operation conducted merely in the guise of an export association? The commission says the act does not intend that operations of an association should become a device for betterment of a domestic market, its purpose being to lessen competition between domestic exporters in foreign markets. The commission says it is difficult to distinguish between a betterment of the domestic market expressed in a rising domestic price which is the result of the proper coordination of export to domestic consumption, and similar movement directed to the domestic market in which this result is directly and primarily intended through an adjustment of competitive relations in a foreign market. The law prohibits monopolistic efforts or interference with competition by concerted action in the guise of a production of benefit to the public. The commission says "a beneficent purpose will not legalize conduct otherwise unlawful." "The mere fact that there is a rising price in the domestic market will not be a controlling element," the opinion says. adjustment of distribution may result in an increase in price in a glutted market and a decrease in price in one which is insufficiently supplied. The arrangement must be devoid of any concerted curtailment of production or withdrawal from the domestic market of any part of its normal supply. An incidental or inconsequential effect upon domestic prices is not unlawful. If a merely consequential rise in price should bar American exporters from using this law, the law might become a nullity. The law provides a lawful course of procedure, and if followed and the law complied with merely indirect or consequential results cannot be held to be against the law. It is settled under the Sherman act that a contract which 'only incidentally or indirectly restricts competition is not denounced by the act."

WILL NOT ORGANIZE

However, after careful consideration, it has been decided that at the present time no effort will be made to organize a silver export association under the Webb act.

DEPARTMENT OF COMMERCE AND MINING

Department Of Commerce Organizes Mineral Division To Aid In Exportation Of Mine Products-Experienced Mining Man Plans Close Contact With Industry

ECOGNIZING the need for an expanding export market for surplus products of the mines, quarries and metallurgical industries above the requirements of the domestic consumption, Secretary of Commerce Hoover has established a Mineral Division in the Bureau of Foreign and Domestic Commerce for the service of the mining industries. This division has been created by combining the former Petroleum Division and the Mineral Section of the Iron and Steel Division. The entire personnel of these former sections have been taken over by the new Mineral Division, whose chief is Guy C. Riddell, a consulting mining engineer of wide experience in the mining and smelting industries, who, as general manager for a Sino-American house engaged in the Far Eastern export and import trade, has an all around practical experience in the export field.

It is the hope of Secretary Hoover and Mr. Riddell that the Mineral Division, which has been established at the suggestion of the trades, will be of real service to the metal and mineral industries of the United States. The division will not attempt to exercise any supervisory or regulatory influence over the mining industry, nor will it seek to pry into the internal affairs of mining companies or require them to submit reports or other data of a statistical or general character. The great objective of the Department of Commerce is the promotion of exports, and the Mineral Division will focus its efforts in this direction for mineral products.

FOREIGN MARKETS SOUGHT

"The Bureau of Foreign and Domestic Commerce is concerned chiefly with the collection and dissemination of information relating to foreign markets for American goods, and this will be the aim of the Mineral Division," said Mr. Riddell, when asked as to the scope and assists American firms engaged in for-

eign trade by furnishing information concerning overseas market; commercial conditions in foreign countries; nature of the competition encountered and methods of meeting it; sources of supply of ma-



Guy C. Riddell

terials, especially raw products; tariffs; customs regulations; commercial laws; shipping and financing; and many other subjects. Data regarding foreign fields are received from the bureau's own commercial attachés; resident trade commis-

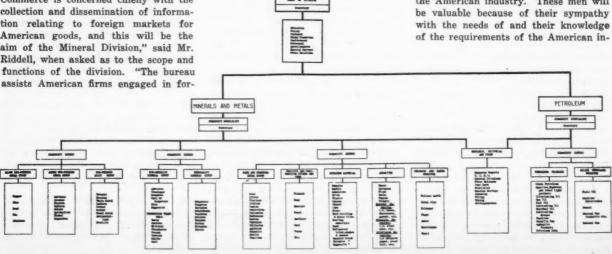
MINERALS DIVISION

sioners; and traveling trade commissioners, who are specialists in particular lines; and American consular officers. The bureau maintains district and cooperative offices in the United States and has commercial attachés and resident trade commissioners in the principal capitals and commercial centers of the world and a corps of experts in various lines who travel in various parts of the world. The bureau is solely a 'service' branch of the Government and concerns itself only with promoting American commercial interests in the world's markets."

COOPERATION OF MINING MEN

Mr. Riddell has been lining up the cooperation of the mining industry with the work of the division through a series of conferences in New York and Washington where he has consulted with representatives of the industries, including the American Mining Congress. "Real service to the mining industry" has been the keynote of Mr. Riddell's conferences. He invites the mining industry to avail itself of the use of the facilities of the division in advancing its markets for metal products in foreign fields. The division will specialize in the marketing of metal products abroad and will apply the general principles of the Bureau of Foreign and Domestic Commerce to the mineral industry, thus assuring it more adequate treatment than has heretofore prevailed.

The division will encourage the use of trained mining and metallurgical men as trade commissioners and commercial attachés in order that conditions in the mining and other industries abroad may be interpreted in such a way as to assist the American industry. These men will



dustry. At present three of the bureau's foreign attachés are in Washington conferring with other branches of the department with a view of showing the need of a proper interpretation of economic conditions abroad as affecting American conditions.

'The division will conduct world surveys of the major metals and minerals through facilities available in American consular officers and the bureau's own trade commissioners and commercial attachés. Already numerous requests have been received from the mining and metal industry in the United States for accurate information on foreign resources and markets. Among these investigations will be a world survey on the production of lead; a treatment of the world zinc situation has just been completed and published in the form of supplement to Commerce Reports Trade Information Bulletin No. 246. For American petroleum and mining interests seeking activity in foreign fields, detailed information as to the resources and existing development of the country and the conditions under which business can be done, is already available for many fields. While this service may result in a certain amount of importation of foreign raw materials as well as the direct furtherance of exports, Mr. Riddle points out that export follows import, raw materials advance to finished products, and that the United States by this policy will "sell more than it buys."

Among the other services of the Department of Commerce, Mr. Riddell will make periodic visits to New York to act with the committee which prepares the weekly metal market reports, the Bureau of Foreign and Domestic Commerce collaborating in this with the Bureau of Mines and the Engineering and Mining Journal-Press.

RIDDELL'S SERVICE

Mr. Riddell is well qualified by training and experience to direct the activities of the Mineral Division. Graduated in mining and metallurgy from the Massachusetts Institute of Technology, he is a member of the Mining and Metallurgical Society of America, American Institute of Mining and Metalfurgi-Engineers, New York Metal Exchange, and the Technology Club of New York. His writings on mining, metallurgy and foreign trade have appeared from time to time in the technical press. From 1904 to 1910 he was chemist, assayer and construction and mechanical engineer for the American Smelting and Refining Company in Montana, and from 1910 to 1916 superintendent of its lead smelting plant at East Helena. Mr. Riddell's consulting practice has included China, Australia, Mexico, Alaska and the United States. In 1916 and 1917 he directed the reor-

ganization of equipment and method at the great lead and zinc smelting plants of the Broken Hill Associated Smelters at Port Pirie and Broken Hill, Australia. In 1919 and 1920 he was consulting engineer for the Wyomass Oil Company and Rocky Mountain Oil and Producing Company of Wyoming, and the Virginia-Washington Lead-Zinc Corporation of Missouri.

From 1918 to 1920 he was chief of the Metals Staff of the Tariff Commission. From 1920 to 1923 he was director, consulting engineer and secretary of the Wah Chang Trading Corporation of New York, importers, exporters, engineers and manufacturers' agents.

During his service Mr. Riddell has conducted investigations and research at important lead, copper and zinc smelting plants and mining districts in the United States and Canada. In 1918 he directed proceedings at the Denver and San Francisco hearings of the Tariff Commission to which all American producers, consumers and importers of tungsten, mercury and antimony were invited. His work in Alaska had to do with the Bering River coal fields.

The accompanying chart shows the ramifications of the new division.

NEW MACHINERY CATALOGS Allis-Chalmers Manufacturing Com-

pany, Milwaukee, Wis., has just released a new catalog devoted to Allis-Chalmers compressors or blowing engines. The catalog is fully illustrated and covers valves, intercooler, governor, motor and gas engine-driven compressors, etc. These compressors may be furnished complete with Corliss steam engine, gas engine or synchronous electric motor drive. Copy sent on request.

Allis-Chalmers Mfg. Co. has just issued a new Bulletin 1461 on "Superior McCully Fine Reduction Gyratory Crusher." This bulletin is illustrated and thoroughly describes the equipment, giving, among other information, a table showing sizes, capacities, horsepower and weights.

The Dodge Manufacturing Corporation, Mishawaka, Ind., have placed on the market a new lineshaft bearing embodying the Timken Tapered Roller Bearing as well as several new features of construction. Full information concerning this product may be obtained by communication with either the Dodge Manufacturing Corp., or the Timken Roller Bearing Company, Canton, Ohio.

Lincoln Steel and Forge Company, St. Louis, just has issued a new bulletin on the Lincoln Greasing System for mine cars. The bulletin is fully illustrated and copies will be gladly mailed upon request to their home office, 5701 Natural Bridge Ave., St. Louis, Mo.

Catalog No. 29, published by the W. A. Jones Foundry & Machine Company, is just off the press. It describes in detail giant gears to small pinions—every kind, shape and manner of gear—spur gear speed reducers, enclosed worm gear drives, gears made from cast iron, cast steel, forgings, rawhide, bakelite—teeth cut or molded—spur, bevel, worm. All are dimensioned, described, illustrated and tabulated in the new "Jones Gear" catalog, which contains 224 pages of specific detailed informadrive. Copy sent on request.

G-R BENTUBE EVAPORATOR

THE G-R Bentube Evaporator is designed for the production of pure distilled water for boiler feed makeup. This method of water purification eliminates all scale-forming material from the water before it enters the boiler, thus considerably improving plant operation.

The essential features of construction are a shell and vapor dome of welded steel plate, with tube headers of cast iron into which are expanded seamless drawn Admiralty tubes which are bowed. The steam enters the tubes and evaporates the raw water in the shell. These bowed tubes distort with temperature changes, effectively cracking off accumulated scale. The tube bundle consists of a series of independent vertical sections, each easily removable for inspection.

The G-R Bentube Evaporator is manufactured by the Griscom-Russell Company, 90 West Street, New York, the manufacturers of the well-known Reilly Evaporator. The G-R Bentube Evaporator is fully described in their Form 195, which has just come from the press.

JONES DOUBLE THRUST WORM BOX

THIS box has just been placed on the market by the W. A. Jones Foundry & Machine Company of Chicago. It provides an accurate and rigid support for the worm shaft and holds a liberal supply of oil in which the worm operates. There is also provided finished thrust washers at both ends of the worm consisting of two steel and the center one of hard fibre. The bearings are babbitted and bored and also faced on These boxes are now made in standard sizes to suit standard cut steel worms as made by this company and both the boxes and gears are covered by their new catalog No. 29, entitled, "Jones Gears," which is just off the press.

These boxes are recommended to be used with open worm gear drives when something less expensive than a completely enclosed unit must be used.

THE TRUMBLE OIL SHALE CYCLE DISTILLATION PLANT

Visit To Alhambra Plant Reveals New Process—May Mark New Era In Distillation Of Shale

Trumble at his experimental plant at Alhambra, Calif., bid fair to mark a new era in the distillation not only of oil shale but of coal and other hydrocarbons. The distinguishing features that mark it off from other processes are:

a. The process is cyclic in character; that is, instead of producing the oil from shale in one operation and then distilling the crude oil into gasoline and other products in a second operation, the gasoline is produced from the oil shale through one continuous operation in which the crude oil occupies only an intermediate stage.

b. After the plant is once started more heat is produced than is needed to run the plant itself and the excess can be used for other purposes.

c. The power produced is sufficient to operate the cycle unit, to provide power for mining, transporting the shale, disposing of the spent shale, with an excess of 50 per cent for other uses.

THE PREHEATER

The shale, broken to six-inch size, including all smaller sizes, is first delivered to a preheater, above the retort, and subjected to a temperature of 400 degree Fahrenheit. This heat is produced in the process of decarbonization of the spent shale. The shale passes

from the preheater down into the retort.

THE RETORT

The retort in which the oil is produced is 30 inches high, 14 inches in diameter, and holds a charge of 150 pounds. (The commercial size will be 6 feet in diameter and 20 feet high to hold 15 tons.) The retort is of the vertical type with no internal device of moving parts for advancing the shale. The process is one of charging and recharging without loss of heat or continuity of operation. Vapors from the cracking still enter

By Victor C. Alderson*

[Note.—The following article was written after a personal visit to the plant. The statements made are issued with the approval and authorization of Mr. Trumble, except the concluding paragraph.]

the lower part of the retort, come in contact with the raw shale preheated to 400 degrees, lose a part of their own heat and thereby raise the temperature of the raw shale. Finally superheated steam is injected to complete the process of distillation and the production of oil and gas vapors.

THE DEPHLEGMATOR

The entire product from the retort goes to the dephlegmator where a separation and condensation is made of the light and the heavy oil. The temperature is fixed for a light distillate, e. g., 48 gravity Baumé. The light cut, or gasoline distillate, passes to an agitator, where the pyridene and other impurities are removed as an acid sludge. This sludge is redistilled to recover the pyridene and the acid. The light cut gasoline is redistilled in the presence of saturated steam and condensed into water white gasoline. The heavy cut is returned to the cracking still where it is recracked and follows the cycle.

The cracking stills—horizontal—tubular—36 inches long and 12 inches in diameter, three in number (in a commercial plant 36 inches in diameter by 18 feet in length) receive the product of the dephlegmator; that is, crude oil. In each still are two tubes one within the other. Superheated steam is injected into the inner tube and supplies the heat for cracking.

As heat is lost the resulting steam is returned to the superheater and the temperature raised to the necessary useful degree of 1,200 degrees. An ingenious revolving spiral device removes the accumulating carbon around the tube from which it is carried to a carbon pot, whence it goes to the accumulated spent shale.

SULPHATE OF AMMONIA

The sulphate of ammonia is extracted by ordinary well-known methods.

PRODUCER GAS PLANT

The hot spent shale at a temperature of 1,000 degrees from the shale distillation retorts, and the hot carbon from the cracking stills, pass into the decarbonizer, which is also the preheater for the raw shale. This operation raises the temperature of the raw shale 400 degrees before it goes into the distillation retort.

The superheater is of special design and placed below the ground level. The boiler is placed above the superheater and is heated by the waste gases from the superheater. The super heater is installed in sections so as to act efficiently both in the first production of superheated steam and in adding heat to the steam returned from the stills.

THE TURBINE

Steam and oil vapors from the retort pass to a steam turbine. This is connected to a generator to produce electricity for general power uses.



A Typical Oil Shale Deposit

* President, Colorado School of Mines.

To start the plant wood kindling would be placed in the bottom of the decarbonizer and lighted. The decarbonizer and preheater would be filled with raw shale. The burning of this raw shale produces gas which passes through a central compartment of the decarbonizer, and also through an ordinary gas scrubber, to the superheater and, on burning, starts the superheater and the cycle. After the cycle is once started the outer shell or chamber of the decarbonizer receives hot spent shale and hot carbon instead of the raw shale with which the start was made. Once started the cycle of operation is continuous.

THE STEAM CYCLE

The steam passes from the boiler, under pressure of 100 pounds, to the superheater, then to the cracking still, then back to a superheater, then to the retort, and then is released through the steam turbine, then into the dephlegmator, and finally to the condensers where it is condensed along with the gasoline distillate into water and back to the boiler.

Tests on the crude shale oil and the gasoline, made by Professor R. A. Baxter at the Colorado School of Mines, gave the following results:

Crude Shale Oil—Gravity, 46.50 degrees A. P. I.; saturation, 81 percent; color, 4.8 N. P. A.

Gasoline—Color, approximately water white; odor, pleasant and sweet; doctor test, negative; gravity, 68 degrees A. P. I.; water and suspended matter, none; acidity (distillation residue), neutral; saturation, 84 percent.

Distillation — Overpoint, 55 degrees C.; 5 percent, 58 degrees C.; 50 percent, 92 degrees C.; 90 percent, 155 degrees C.; 96 percent, 158 degrees C.; Endpoint, 97 percent, 165 degrees C.; residue, 1.5 percent; loss, 1.5 percent.

The saturation on both the crude shale oil and on the gasoline is unusually high.

A COMMERCIAL PLANT

The lowest sized commercial plant should have a daily throughput of not less than 100 tons, but a plant of 500 tons capacity is preferable. The cost for a 1,000-ton plant is estimated at \$450,000 or \$450 a ton, but smaller plants would cost much more per ton. The cost of producing gasoline is estimated to be less than by any other method.

A WORD ABOUT MR. TRUMBLE HIMSELF

Coming to Southern California twenty years ago a sick man, by a union of personal determination and healthgiving climate he refused to die. As a young man he went to work in the oil fields and gained health and experience in well drilling, pipe line construction and refining, and so became master of

the details of the entire oil industry. Through his own efforts, aided by natural talents, he has made himself the inventive genius of the oil business. He is the inventor of three highly important advances in the industry: the Trumble refining process, first used by the General Petroleum Corporation and later by the Shell Company; the Trumble cracking process used by the Shell Company. The Shell Company paid him a million dollars for these two processes. He is also the inventor of the Trumble Gas Trap. His inventions are in use all over the world wherever oil is produced. Six years ago he attacked the oil shale problem. His experience in oil stood him in good stead in the solution of this new problem. The present location at Alhambra is the fourth he has used. Retort after retort has been erected, tried, and found useless. The present plant which unites the retorting and refining in one continuous operation is the apex of his work. Inasmuch as Mr. Trumble is a man of means he asks no financial aid but meets all expenses from his own resources. As Mr. Trumble has made an enviable record in the well oil industry it is quite likely that he will be known as the oil shale genius of this decade.

CURRENT OIL SHALE NOTES

THE work of M. J. Trumble at Alhambra, Calif., marks distinct progress in producing oil and gasoline from shale. Up to the present time experimental work has been done in two separate fields: first, the retorting of the shale to produce oil; second, the refining of the oil. Experimenters have been of two classes. Their work has not overlapped. They were devoting their efforts either to producing oil or refining it-not to both. Mr. Trumble now enters the field with a plant that regards oil only as an intermediate product. In one operation he produces water white gasoline direct from the shale. By economy of operations and conservation of heat he produces an excess of power that can be used for other purposes than operating the plant. The process is described in detail in the July Quarterly of the Colorado School of Mines.

Sweden is alive to the necessity of utilizing her oil shale deposits, since she is dependent on foreign countries for her coal and oil. After successful experiments at Stockholm, which developed a retort adopted to her oil shale, a commercial plant is being constructed at Kinnekulle where lie her richest deposits. It is estimated that this plant will produce annually 250,000,000 tons of crude oil at a price which will undersell the imported oil. Thus Sweden will soon be out of the market for foreign oil.

The Ginet retort of the Monarch Shale Oil Company at De Beque, Colo., is

now in continuous operation, with a throughput of 70 tons of shale a day. Improvements have been made to standardize the product. A practical road test of the gasoline produced showed that 30 miles could be made in an automobile on a gallon of gasoline.

Brazil is short of a domestic supply of fuel; she imports large quantities of coal and oil; her industries are hampered by the high cost of fuel. Much work has been done in developing her oil shale deposits, but a successful outcome has been delayed by badly managed practical efforts to produce oil from shale; by the existing unfavorable rate of exchange for the importation of machinery, and by the small margin of profit. When the price of crude oil in the open market rises sufficiently, Brazil will be forced, in self-defense, to develop all of her oil shale resources.

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CLAY IN 1923

THE output of clay mined and sold as clay in the United States in 1923 amounted to 3,434,660 short tons, valued at \$11,188,913, or \$3.26 per ton, according to figures compiled by the Geological Survey in cooperation with state geological surveys in Alabama, Florida, Georgia, Illinois, Iowa, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Virginia, Washington and Wisconsin. These figures show an increase of 30 percent in quantity and 34 percent in value as compared with those for 1922. They represent only clay sold as clay by the original producers; they do not include the much greater quantity of clay that was burned into clay products by the producers themselves.

The output of kaolin, the clay that is used in making high-grade pottery and porcelain as well as paper and other products, amounted to 336,803 tons, valued at \$2,926,255, an increase of 22 percent and 25 percent, respectively, as compared with 1922. The clay of largest production and value is fire clay. The sales of fire clay in 1923 amounted to 2,298,163 tons, valued at \$6,565,899, an increase of 37 and 42 percent, respectively, as compared with 1922. The output of clay of every kind increased in quantity and value in 1923 as compared with 1922, except stoneware clay, which decreased slightly in quantity but increased considerably in value.

The imports and exports of clay also increased in 1923 as compared with 1922. The imports were 391,354 tons, valued at \$3,670,369, an increase of 9 percent in quantity and 8 percent in value. The imports of kaolin, the chief clay imported, amounted to 311,298 tons, an increase of less than one percent as compared with 1922.

STUDY OF BIT STEEL USED IN OIL DRILLING

A study of the efficiency of drill bits and steel parts in general as affected by oil field conditions has been undertaken by the Department of the Interior. A metallurgist attached to the petroleum experiment station of the Bureau of Mines, Bartlesville, Oklahoma, has been placed in the field to conduct the investigation. A study of time lost due to wear and breakage of steel components is also to be made. Figures obtained by the Bureau of Mines from a company which has conducted a complete timelost study of oil well drilling in six of its wells in Oklahoma show that in rotary drilling only 31.2 to 36.54 percent of the total time to bring in a well was spent in actual drilling and that 21.5 to 29.3 percent of the total time,

amounting in one instance to 250 hours. was spent in pulling out and running in to change bits. In cable tool drilling 37.4 to 54.13 percent of the total time was spent in actually drilling and only 1.49 to 2.94 percent was spent in changing dull bits. It is thought that much time spent in changing bits on rotary rigs may be saved by increasing the footage obtained per bit and that the speed of drilling may be increased in both methods of drilling. The figures given here are from the logs of only three rotary and three cable tool drilling wells, but it is hoped that with the aid of operators and contractors more extensive data from this and other fields can be obtained which will be of aid to well drillers generally. At present

work is under way in the Tonkawa and Burbank oil fields, but the work will not be confined to this one locality.

One of the continual hazards of the oil industry, says the New York Journal of Commerce, is the chance that lightning may strike one of the great steel tanks in which the products are stored. A British oil company, the Anglo-Persian Oil Co., has attacked this problem in a scientific manner. Small models of oil tanks were built and exposed to violent electric sparks, simulating the lightning. The result is a plan of protection by iron rods about 50 feet high erected near the tanks. These rods attract the lightning and the tanks themselves are unharmed.

"THE ONE THING NEEDFUL"

Wadleigh Takes Issue With Editorial—Advocates Extensive Research For Coal Industry

"I HAVE just read an editorial in the August issue of the AMERICAN MINING CONGRESS JOURNAL entitled, "The One Thing Needful."

Some of the statements made in this editorial are so contrary to my understanding of the situation as regards coal that I am asking for both "enlightenment" and "understanding."

The editorial states: "The coal industry has abundant enlightenment on every phase of its complex business." It goes on to say, "The question is whether the coal trade understands what it has learned. The facts are put before it, it reads the facts every day and then goes about doing the same old thing in the same old way." I question the statement that the coal industry "reads the facts" every day. While it is true that a large amount of information regarding the industry has been collected and, in many cases published, I cannot agree with the statement that the industry reads the facts, for it is notorious that it does not. How many in the industry have "read the facts" collected by the U. S. Coal Commission? To my mind, one of the great needs of the industry is some method of insuring that the industry does read, learn and digest the information that has been gathered.

To say, as the editorial does, that we have about all the information that is necessary, is so contrary to what is the case with other leading industries that I am surprised at such a statement being made under the authority of the American Mining Congress.

I cannot agree with the statement that "The one undisputed and known fact is that the one thing which most retards coal trade progress is that each man believes himself virtuous and his neighbor corrupt; himself the sources of integrity and altruism and his neighbor the embodiment of dishonesty and pigheaded selfishness." To my mind, such a statement is absolutely untrue and an undeserved slur on the coal trade.

The editorial goes on to say: "The facts are that the average man in the industry is remarkably clean. The average conception of a coal man's duty to society is decidedly of a high order." I submit that, if the coal man believes what has just been stated about himself and his neighbor, his conception of his duty to society is most decidedly not of a high order.

The editorial also states: "We are through with research." This seems to me an astounding statement to come from a technical body, such as the American Mining Congress, and seems to give an entirely wrong idea as to what research is. Research is not a mere collection of facts and the use of the term to characterize such an activity is incorrect. Research is a study of phenomena; an investigation or an inquiry. There are many things that we do not know about coal and new discoveries regarding it are being made almost every day; we do not even know the constitution of coal, so that to say we are through with research and presumably think we know all there is to know about coal is to make the industry ridiculous if it holds such an assump-

We have not enough of enlightenment, but we have too little of both enlightenment and understanding. We cannot have enlightenment and not have understanding.

Yours very truly,

F. R. WADLEIGH, Vice-President, Tuttle Coal Corporation.



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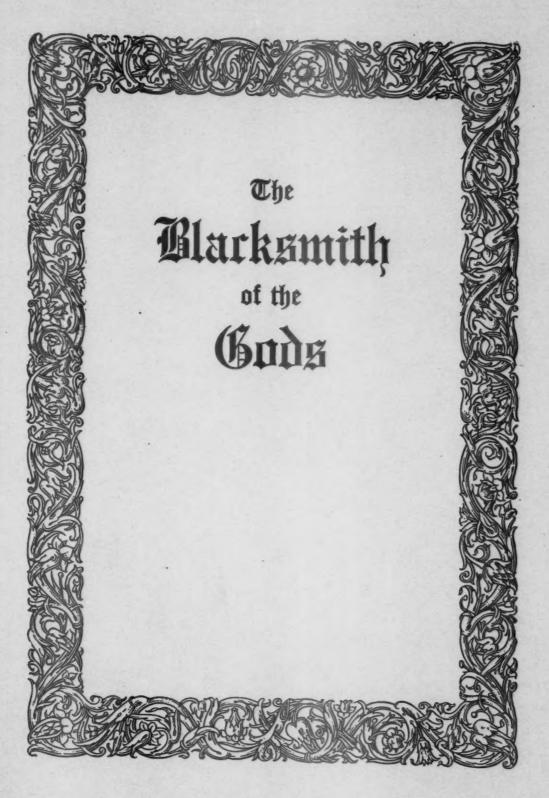
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NCE there was a simple hearted Nubian giant who came out of the marshes to live in the settled places of the earth. He was of great age but such was his virility that his strength increased with his years. Having lived so long alternately in the water and under the blistering sun, his skin and even his flesh was as black as ebony.

At first men feared him and would have exorcised him for an evil spirit but he won their hearts by his kindly smiles and patient work. He could turn their mills faster than the wind and water together and after a day of labor he asked only a dinner and a truss of straw upon which to sleep. He would pull all of their wagons to the city even when they were piled high with the produce of the country-side. As he became accustomed to the ways of the city, he studied to make the people happy. He spun a new machine called a dynamo so fast that the sparks from it lighted the whole city and even spun the little fans before which men cooled themselves in summer.

The Maning to make sure that the giant would remain at home and work for them, they put him in chains and even set certain of their number to watch him. And, they being proud to be the master of a giant, saw fit to scourge him. From that day, the face which had smiled upon everyone became sad and the heart which had been merry knew what it meant to regret. The Nubian giant was sick and the people had to look for another to do their work.

IMoral: -- Ingratitude -- even to the coal industry -- was never a proper reward for faithful service.

The Ugly Brother

NCE, a man went on a journey leaving five stalwart sons to his brother who owned much property and conducted great enterprises. The first and second born were well favored, of winsome personalities and soon were much desired everywhere. Their uncle entrusted them with the exchange of his goods and made them the masters of the arts of his household. He built for them many mansions and they lived in splendor.

The third born had a gift of magic. He could cause houses and even streets to blaze with light, machines to spin and purr when nothing seemed to move them; even vehicles at his command moved swiftly from place to place without horses to draw them. The uncle made of him the master of wizardry.

The fourth born possessed such strength that when he stretched his arms across a river, the people carrying their goods, could pass over dry shod. The uncle made of him the master of building and of transportation.

The fifth born was known as the Ugly Brother. The uncle, noting his ungainly and cumbersome movements, sent him to keep the fires. As time wore on, the uncle became fonder of his four popular nephews but so much out of patience with the Ugly Brother that he often contemplated sending him away. One night, the Ugly Brother, knowing that he was about to be dismissed, called his four famous brothers to him and said:

What shall happen to me is of little account, but if my fires stop, your strength will cease, your wizardry will disappear and your popularity will wane because I have been at the bottom of all of your good fortune and you have but displayed what I have produced.

Thereupon the Ugly Brother went back to his fires and the four elder brothers, uneasy over their futures, went at once to the uncle to plead the cause of the Ugly Brother.

GMoral:-Merit resides in accomplishment and not in appearances.

(Shall we say that the five sons were gold, silver, copper, iron, and coal.)

The Lost Key to Arcadia

HE King of Arcadia, being about to set out on a journey, desired to safeguard his treasures during his absence. So he caused to be collected all of the arts and sciences of his realm and locked them in a vault.

As he was passing through a woods which lay between his capital and his destination, he was attacked by outlaws and slain. His courtiers who had been idling pleasurably by the way came upon the body of the king and returned with it mournfully to the palace. When the king's son had been crowned and called for the key to the treasure house it was nowhere to be found. Thinking it had been stolen by the outlaws, he caused all of them to be apprehended and hanged, but this did not return the missing key.

A period of misery ensued for the people of Arcadia. For want of the key to their arts and sciences, they could build but the crudest of dwellings. And, they had nothing but the unpacked earth for roads and only the slowest of animals to pull their wagons. For the same reason, business ceased and the merchants, having nothing to sell, closed their shops.

Tone day, a hungry workman, grubbing for roots near the foundation of the old treasure house, came upon the key and joyfully restored it to the king. During the night, the people rebuilt their houses, relaid the lost roads and filled them with moving vans. By sunrise the next morning the familiar pursuits of industry and commerce were resumed.

Moral: - When in search of the kep to human industry, it is well to look in the earth,

(Note: Orderly industrial progress dates only from the discovery and use of coal.)

The Task of the Scuttles

STRANGER, upon arriving in a community where lived a severe and industrious people, was carried forthwith before an austere judge who assigned him the task which he must perform daily if he wished to reside in that part of the world. The task was to fill a given number of scuttles with coals, from a certain pile, each day, and oversee its distribution to those who needed it. The stranger accepted the terms gladly for it was a pleasant place in which to live and the task seemed easy.

This station was beside a pile of coals which men were constantly replenishing from a stock underground but which porters were constantly diminishing as they carried the scuttles away to feed the forges and furnaces which he saw in the distance.

The stranger was no sooner alone at his work than those whose business it was to hoist the coals from their store-house in the earth quit work and disappeared. Even so, the porters continued to carry away the scuttles and the pile at his feet soon disappeared. Then, those who stood by the forges and furnaces came to their doors and screamed to him to send them more coals, before their fires died and their iron was ruined.

The next morning, the men who recovered the coals from their storehouse were even more busy than formerly but the porters had disappeared. Then the miners complained that they had no place to put their coals and the smiths that they had no coals.

When the porters had returned, those who attended the furnaces and the forges had banked their fires and gone home.

Amoral:—Distance and unfamiliarity often obscure difficulties and cause hard tasks to seem easy.

(The coal operator is the man of the scuttles.)

The Black Sheep of the Potomac

FARMER, living in the pleasant valley of the Potomac, owned a flock of sheep which grew him two crops of wool each year off which he lived pleasantly and well. One of the flock, endowed with a thick and lustrous black coat—a source of great profit to his master—had formed a habit of seeking seclusion. Because he preferred to be alone, he roamed the pastures in the wake of the others and lived off what they had passed over.

One year, due to heavy rains and other extraordinary conditions, there was an abundant crop of grass—enough to gorge the whole of the flock and leave some patches growing rank and untouched. That year, the sheep with the black coat often roamed the pasture in company with the others and ate his fill where they grazed. Noting, one day, that the hermit sheep had joined the others, the master sent the shepherd with his dogs to drive him back into his former isolation. The offending sheep resisted until the shepherd struck him smartly with his staff and exclaimed:

"Why should you now try to eat of the first run of the grass when you have always been content with that which the others left?"

That night, when they were gathered into the sheepfold, the sheep that had been rebuked called his brethren around him to ask:

Why should I be thus singled out for such unwarranted punishment? Do I not produce as much wool at the shearings as the best of you? And, is not my wool ready for the spinner, the weaver and the garment maker, since nature has saved master the trouble of dyeing it, while all of yours must pass through the vats? What, then, is my fault?"

One of the wise old rams of the flock made answer thus:

The notable color, beauty and usefulness of your coat made your conduct conspicuous and your habitual neglect of nourishing food advertised your ability to live without it. Among men, the custom is that what you have done by choice, you are expected always to do."

Afforal:-Mobesty and retirement if persisted in probe a handicap to ambition.

(A modest post war increase in coal prices was resisted when a much greater rise of other prices was taken for granted.)

The Workers of Saugatuck

WO workmen traveling by separate paths through the woods came simultaneously to the point where they joined. They were about to continue their journey together when one, called Adam, stopped the other, called John, and seating himself on a projecting root, said:

It is plain that our destinations are the same since this path leads only to the mill of Jenkins, the Lumberman. Your mission is probably the same as mine, for I go to find employment that I may sustain my family. Labor is scarce in these parts and Jenkins has sore need of both of us. Therefore, I propose that we agree here upon the terms we shall exact and, upon arriving there, each stick to his terms.

The one called John indicated that he was listening and Adam continued:

In My terms will be that I must dictate the hours I shall spend at work, the rate of pay, the amount of work I shall be asked to do and the number and kind of tools to be employed. I must be consulted before others are employed and if I object they may not work. And, I shall expect my proportion of any profits which Jenkins may make."

"You seem to have mistaken my mission" replied John. "I am trying to hire myself out as a worker and not as the manager of Jenkins' business. My own needs are too urgent to permit me to exact such terms."

"By which theory," replied Adam, "you will always be a worker whereas I expect in time to own the mill."

At this point, the chance acquaintances realized that they were about to quarrel over what was about to happen to another man's property. So, being sensible men, they parted and each sought employment in a different place.

CMoral:—We is indeed a fortunate man who can distinguish between friend and enemy when employing a belper.

(Note: It may be said in passing that of all the bituminous coal mines, 60 % employ union and 40 % non-union labor.)

The Rubian Prince Travels

NUBIAN prince once found himself in a strange city and desirous of reaching another he inquired concerning the cost of passage and was told that for one hundred guineas the coach would deliver him to his hotel in a very few hours.

The prince was not only a great traveler but the owner of many horses. And, being familiar with such things, he won the coachman's heart by praising the spirit of his horses, the beauty of his coaches and the magnificence of his trappings. In such friendly discourse they compared values of such things in many countries, by which adroit method the prince soon knew the exact value of the coachman's outfit. Thereupon, the prince said:

I"By your own statements, my friend, your whole equipment stands you but fifty guineas. Yet you would charge me one hundred guineas for one trip and propose also to collect other fares from other passengers. It would be cheaper for me to buy your equipment, carry myself and my friends over the road and make a present of it to some worthy fellow at the journey's end."

To which, the coachman replied:

Thave you, by any chance, noticed the officer of the king who stands outside yonder gate. That highway is, by the king, set aside for my exclusive use. You may own ever so many vehicles, but the road is closed to you."

IMoral:- Logic is of no balue when dealing with those who have a friend at court.

(The railways pay, annually, only half a billion dollars for all the coal used to haul all of their traffic, yet collect annually more than a billion dollars for carrying the coal used by others.)

The Fat Stallion of Normandy

DRAYMAN of Normandy owned a stallion of such amazing strength that he could pull the load of forty ordinary horses. The owner took such pride in his strength and his sleek coat that he exhibited him before his majesty the king.

The king was solicitous for the welfare of his people and thinking to encourage the breeding of such horses, he decreed that, henceforth, no other horse should draw the carts which carried any provision to his palace. Much to the king's surprise, the people abandoned their own stables and demanded that the wonderful stallion should draw their carts also.

Seeing that now he had a monopoly of the carting for the capital, the owner of the stallion was so solicitous for its health and safety that he indulged it in every way. By now, so much demand was made upon its great strength, that the stallion consumed vast quantities of food daily. To relieve the drain upon his own purse, the drayman allowed his favorite to forage among the loads which were piled upon the cart.

Soon, the husbandman began to complain that whereas he sent a full basket of fruit to market, only half of it arrived. And, the people began to say that they had to pay for a full basket of fruit but received only half of what they paid for. When the cause of the loss became known, some entrusted their precious cargoes to camels which, as everyone knows, carry their own food, while others employed great condors which never feed while traveling.

Coloral:—Chen the labor of kings will not save those who would feed at the expense of others.

(Perhaps it is unnecessary to identify these characters as the railways, the automobiles and the airplanes or to say that this explains the high price of coal.)

The Diplomatic Courier

GENTLEMAN who was successful in war and diligent in business built himself a house in the center of a great park. He won so much praise for the beauty and value of his estate that knowledge of his growing reputation came often to the ears of a great lord whose domain was adjoining.

The day a courier dressed in the livery of his lordship arrived and being conducted into the presence of the rich gentleman said:

"My lord and master regrets that his preoccupation hitherto with wars and matters of state have made it impossible for him to make the acquaintance of such a powerful gentleman and such a desirable neighbor. He regrets deeply to learn that such a worthy gentleman has but recently suffered the loss of valuable retainers."

They were drafted into His Lordship's service by His Lordship," replied the gentleman.

The is grieved to learn that such a diligent neighbor should have lost many of his tenants."

They were driven from my land to till that of His Lord-ship," said the gentleman.

This lordship, having great sympathy for the poor and knowing of your generosity, suggests a joint movement for their relief which must redound to your credit. In fine, he suggests that your park be converted into a public playground."

"Anything further?"

Traving your indulgence, he suggests that your house would serve admirably as the residence of the necessary overseer to prevent the poor from quarreling among themselves."

"And if I refuse-?"

This Lordship, being no longer preoccupied with wars, will call upon you tomorrow at the head of his troops."

Ifforal: -Beware of the powerful who come offering sympathy and cooperation.

(Note: To help the coal industry solve its social problems, the bureaus have recommended that it submit to regulation, by themselves.)

The Ebony Box

GENTLEMAN, whose daughter married against his will, sent her a great ebony box as a wedding present. Knowing that his wrath was hot against her and that he was unrelenting when dealing with his foes, she refused to open it, lest it prove another Pandora box containing all of his curses.

Some years after her father's death, the daughter and her husband were overtaken by misfortune. In such misery were they that they had nothing left with which to pay the servants whom they were forced to dismiss. The Steward, knowing how greatly his mistress feared the ebony box, requested that she give it to him in lieu of his wages. This she did gladly.

When he reached his own house, the Steward made haste to inspect the contents. He soon learned, to his disgust, that it contained nothing but a dull black substance which he had never seen and which he believed to be of no possible value. When he realized that he had forgiven the debt for this worthless stuff, his disappointment knew no bounds and he threw it, as he supposed into the fire. It fell, instead, into the kettle hanging on the crane.

After a while, the Steward, who was also something of an alchemist, noticed a peculiar odor in his rooms and traced it to the kettle from which, by that time, a dense smoke was rising.

Being curious, he carried the smoking and glowing embers to his laboratory, where, before morning, he had extracted a number of liquors which he put into vials. These he carried to his erstwhile mistress saying:

The ebony box which you despised contained a substance which yielded me, in my laboratory, the contents of these ten vials. Each one of these liquors is so powerful it must contain a hundred ingredients. And unless I have gained my knowledge for naught, each ingredient contains a boon for all mankind. Instead of leaving you in poverty, as you supposed, your father appears to have given you a thousand fortunes concealed in one."

Ameral:- To those who are ruled by passion and ignorance, nothing has baine.

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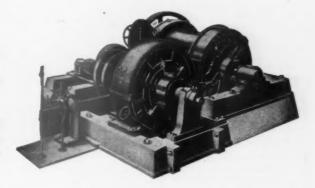


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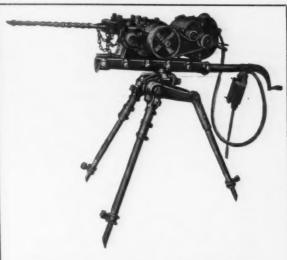


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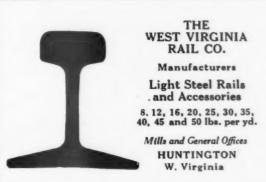
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(ORGANIZED IN 1898)

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To stimulate production of our commercial minerals, that our country in war time may be self-sufficient, and in peace time labor may be employed.

To secure a just system of taxation in order that the government may receive the greatest possible revenue without unduly burdening the industry.

The enactment of a sound National Blue Sky law that will promote and not retard mining development.

The adoption of standards for mining methods, practice and equipment that will eliminate the present great waste.

Correlation of facts surrounding the production of all minerals, to be available to the industry and to members of the United States Congress.

A Division of Industrial Cooperation, looking to a closer relationship between employer and employe in order to bring about industrial peace.

A closer cooperation between manufacturer and producer looking to a greater utilization of labor-saving machinery and our low-grade ores.

To keep the industry completely informed at all times concerning matters of national importance in which it is involved.

Its Achievement

THE creation of the United States Bureau of Mines.

As an unofficial intermediary, it has served both the operator and government in helping solve the peculiar problems that inherently attach to the mineral industry.

Its work in securing the recognition of mining as a "wasting industry" by the inclusion in the Revenue law of the depletion and depreciation clauses has been of untold value to the industry.

Intelligent presentation of facts resulted in a measure of protection in the Fordney-McCumber bill that is gratifying, and for the first time in the history of tariffs, gives proper protection to raw materials.

The Standardization Division is recognized as an authority, and is receiving endorsement from those familiar with its efforts.

Its work in behalf of the silver producer has started that industry upon a new era of prosperity.

Work done in behalf of gold formed the basis for exemption from excess profit tax, resulting in substantial refunds of taxes unjustly assessed.

The creation of an Oil Shale Division presages an investigation of Shale possibilities that cannot but be beneficial to the industry.

The War Minerals bill made available eight million dollars for disbursement to producers who met the government's urgent request, thereby sustaining heavy losses.

sustaining heavy losses.

The Annual Conventions and Expositions are the recognized meeting place of the entire industry, where essential problems are discussed and basic policies formed.

The establishment through annual conventions and expositions of a place of meeting where manufacturer and operator may unite in their efforts to make mining the most efficient industry.

By cooperative effort it has been doing its work quietly for 27 years. It has stood solidly for right and justice in public matters. It stands for protective and constructive laws, and against obstructive and destructive laws, and is unalterably opposed to further governmental encroachments upon private initiative in development of the mineral industries.

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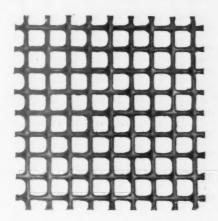
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Joy Machine Company	54	Wilmot Engineering Company	. 7
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